



Original Article

Patterns and Outcomes of Caesarean Section in a Private Hospital Southeast Nigeria: A 2-Year Retrospective Review.

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Abstract

Background: Caesarean Section (C/S) is done to end labour when the health of mother and or baby is in danger. Reports of C/S in Nigeria come from public tertiary hospitals. The aim of this study is to appraise caesarean sections done in a private hospital southeast Nigeria, and contribute to knowledge. **Materials and methods:** This is a retrospective study of age, type of C/S, indications, outcomes, normal vaginal deliveries and C/S from January 1, 2021 to December 31, 2022. Data analysis was done with IBM SPSS version 20. Z test and χ^2 were used to summarize characteristics of variables. Values with $P < 0.05$ were taken as significant. **Results:** There were 381 deliveries in 2021, 30 (7.87%) were by C/S and 410 in 2022, 56 (13.66%) were by C/S. The rise in rate of C/S is significant, $p = 0.008$. The total deliveries within the period of study is 791 and 86 were by C/S giving an overall rate of 10.87%. Mother's mean age was 30.58 ± 5.28 years and age range is 20 to 48 years. The most common indication for C/S was prolonged labour followed by obstructed labour, and 2 or more previous scars. Cephalo-pelvic disproportion and foetal distress came fourth. There was 1 maternal death giving a case fatality rate of 1.16%. There were 5 foetal losses, 2 of which were intrauterine deaths before the surgery and 3 were fresh still births. Most common postoperative complication was wound sepsis that occurred in 4 cases (4.7%). There is no difference in outcome of elective and emergency C/S, $p = 0.366$. **Conclusion:** C/S rate is within the rate recommended by the WHO. Most common indication for C/S is a combination of prolonged and obstructed labour. Most C/S come as emergency. There is no difference in outcome of emergency and elective C/S

Key Words: Rate, Caesarean Section, Outcome, Private Primary Care Hospital

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Quick Response Code:



Introduction:

The exact origin of the Caesarian Section (C/S) operation is not known but dates to prior 1500¹. The first C/S on a living woman was performed in 1500 by Jacob Nufer, a sow gelder¹. Since then, the rate of C/S has continued to increase globally^{2,3}. C/S is done to end labor when the health of mother and or baby is envisaged to be in danger⁴. However, there are indications for the surgery. The need to have a scientifically determined adequate rate informed the study done by the World Health Organization (WHO) and published in 1985. The WHO organized a team of reproductive health experts that met and made a statement “There is no justification to have a rate higher than 10% – 15%”⁵. Increases in C/S rates to up to 10 – 15% at the population level are associated with decreases in maternal, neonatal and infant mortality; however above this level, increasing rate is no longer associated with reduced mortality⁶. Rates less than 5% indicate unmet needs which implies lack of access to C/S by those that need it,⁷ while rates above 15% do not have improved benefits⁶.

C/S rate is high in some middle to high income countries. It is 25.9% in China⁸, 32.3% in Australia⁷ and 45.9 in Brazil⁹. In Nigeria, the rate varies very widely. The population based rates from analysis of data from Nigeria Demographic and Health Survey (NDHS) are very low, 2.0% in 2008¹⁰ and 2013¹¹ and 2.1% in 2019¹².

Tertiary institutions give different rates. A rate of 21.4% was obtained in 2018 from University of Abuja Teaching hospital¹³, 30.3% from University of Port Harcourt Teaching Hospital¹⁴, 18.5% from Nnamdi Azikiwe University Teaching Hospital Nnewi,¹⁵ 19.3% from Benue State University Teaching Hospital Makurdi¹⁶ and 11.3% from Usman Danfodiyo University Teaching Hospital Sokoto¹⁷.

These data are from tertiary institutions. There are little or no data from private health care facilities¹⁴ though private health sector also carries greater healthcare burden than public health sector in Nigeria.

The aim of this study is to make input in literature from the private health sector. The objectives are to determine the frequency of caesarean sections (CS) performed in the hospital during the study period, identify the indications, analyze the maternal and neonatal outcomes, assess the risk factors, compare the outcomes of elective and emergency caesarean sections, identify any trends in the patterns and outcomes, and make recommendations for improving the quality of care and reducing the rate of avoidable caesarean sections in a private primary care hospital.

Materials and methods

This is a retrospective study carried out at Obinwanne Hospital and Maternity, a 30-bed health facility that offers primary and secondary care in Nkpor, an urban town in Idemili North Local Government Area of Anambra State of Nigeria. The hospital has three medical officers and thirty nursing and clerical staff. It has delivery rate of about 400 yearly. Data were retrieved from delivery records from January 1, 2021 to December 31, 2022, a two-year period. The required variables were extracted by trained research assistants using pretested data capture instrument made for this research. The variables are age, parity, booking status (whether booked or unbooked patient), type of C/S (emergency or elective), indications and fetal-maternal outcome. The total number of deliveries was recorded. Multiple pregnancies were recorded as one delivery. Data analysis was done with Statistical Package for the Social Sciences (IBM SPSS version 20)¹⁸.

Frequency tabulation, Z test and χ^2 were used to summarize characteristics of variables and C/S rate. $P < 0.05$ was taken as statistically significant. Results are presented as prose, tables and bar charts.

Ethical approval

Ethical approval was sought for and obtained from the ethical committee of Chukwuemeka Odumegwu Ojukwu University Teaching Hospital, AmakuAwka. The approval number is COOUTH/CMAC/ETH.C/VOL.1/FN:04/0019

Results:

There were 381 deliveries in 2021 and 30 were by C/S. This gives a rate of 7.87%. Six (20.0%) were elective and 24 (80.0%) were emergency. In 2022 there were 410 deliveries and 56 of them were by C/S giving a rate of 13.66%. Seventeen (30.4%) were elective and 39 (69.6%) were emergency. The increase in rate of C/S is statistically significant, $P = 0.008$.

Table 1. Rate of C/S in 2021 and 2022

Z test of equality of proportion of C/S done in 2021 and 2022 shows a significant difference.

Deliveries	2021	2022	Total	p-value
C/S	30	56	86	0.008
All deliveries	381	410	791	0.319

There is apparent increase in the rate of elective C/S though this is not statistically significant, $P = 0.278$,

Table 2. Rate of elective C/S in 2021 and 2022

Z test of equality of proportion of elective C/S done in 2021 and 2022 does not show a significant difference.

Deliveries	2021	2022	Total	p-value
Elective	6	17	23	0.278
All C/S	30	56	86	0.008

The total deliveries within the period of study is 791, and 86 of them were by C/S giving an overall rate of 10.87%. The mean age of the mothers is 30.58 ± 5.28 years with a range of 20 to 48 years. Majority of the mothers were within 30-39 years of age group as shown in

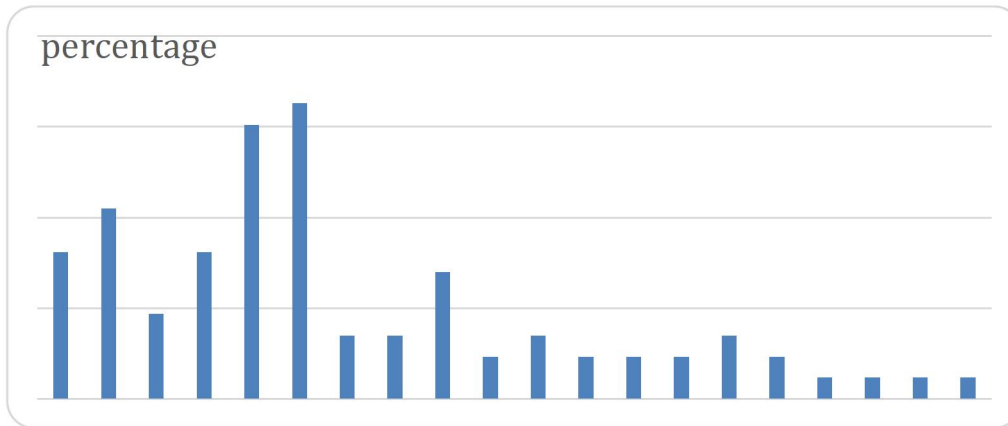
Table 3. Age distribution of the mothers

Age in years	Frequency	Percentage
20 – 29	35	40.7
30 – 39	46	53.3
40 – 49	5	5.8
Total	86	100.0

Indications for C/S

The indications for C/S are as in **Figure 1**. The most common indication was prolonged labor (16.3%) followed by obstructed labor (15.1%), and two or more previous scars (10.5%). Cephalo-pelvic disproportion (CPD) and fetal distress came fourth, in that order.

Figure 1 below shows the distribution of indications for C/S. The commonest indication for C/S is prolonged labour followed by obstructed labour making the combination of prolonged and obstructed labour the commonest indication for C/S.



CPD is cephalo-pelvic disproportion, PIH: Pregnancy Induced Hypertension, GDM: Gestational diabetes mellitus, SROM: spontaneous rupture of membrane

Figure 1. Bar chart of indications for Caesarean Section in Obinwanne Hospital and Maternity and their proportions in percentage.

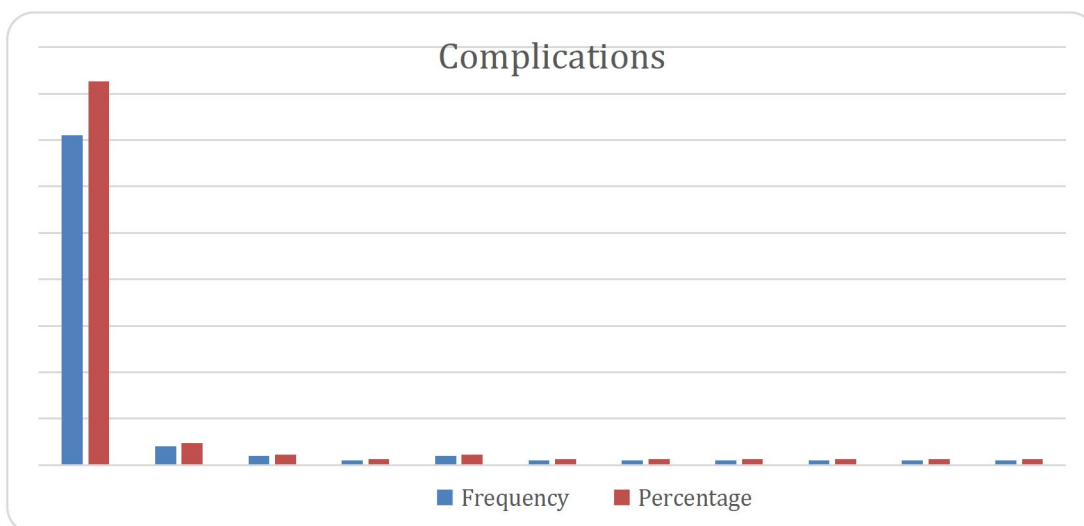
Outcome

There was one maternal death giving a case fatality rate of 1.16%. There were five fetal losses, two of which were intrauterine deaths before the surgery and three were fresh still births. One baby was referred to a tertiary center for severe respiratory distress that required neonatologist attention.

Complications

The most common postoperative complication was wound sepsis that occurred in 4 cases, 4.7%, [Figure2]. There were 63 (73.3%) emergency surgeries and 23 (26.7%) elective surgeries. There was no significant difference in occurrence of complications in emergency and elective C/S in this study, $P = 0.366$,

Figure 2 below shows the distribution of complications of C/S performed in the study facility. More than 80% (71, (82.6%),) did not have complications.



IUD is Intra Uterine Death, DIC is Disseminated Intravascular Coagulopathy, FSB is Fresh Still Birth

Figure 2. Complications associated with Caesarean Section in Obinwanne Hospital and Maternity

Table 4 below stratifies the complications of C/S by type of surgery, whether emergency C/S or elective.

Table 4. Complications of Caesarean Section in Obinwanne Hospital stratified by type of surgery

Type of surgery	No complication	Complication	Total	P value
Emergency C/S	53	10	63	
Elective C/S	18	5	23	
Total	71	15	86	0.366

Discussion:

The overall C/S rate from this study is 10.87%. This is much lower than rates obtained in literature from Nigeria. John and Alegbeleye obtained 30.3% from Port Harcourt¹⁴, Eleje et al got 18.5% from Nnewi¹⁵ and Hilekaan et al got 19.3% from Makurdi¹⁶. From University of Abuja, Isah et al obtained a rate of 21.4%¹³. The higher rates from these centers may be because they are referral centers and as such see more of cases referred for C/S than normal deliveries. Rates from developed countries are quite high. It varies from 32.8% to 60% in USA and is about 46% in China¹⁹. However, our rate is close to the rate of 11.3% obtained by Daniel and Singh from a referral center in Sokoto in 2015¹⁷. Studies have shown that fear of pain, concerns about genital modifications after vaginal delivery, misconception that C/S is safer for the baby, the convenience not only for health professionals but also for the mother and family, fear of medical litigation, and lower tolerance to any complications or outcomes other than the perfect baby may be reasons for the high C/S rates in developed countries²⁰⁻²⁵.

The trend in Calabar General hospital according to Osonwa et al is from 5.55% in 2009 to 7.38% in 2013²⁶. All the values are much lower than the findings from this research even though General Hospital Calabar is also a referral center. It is difficult to explain why the rates are low. It may be that the center still has unmet needs. Adewuyi et al analyzed the 2013 NDHS and obtained a rate of 2.1% as the Nigerian rate¹². This low rate might have been observed because all cadres of health facilities ranging from primary health centers to tertiary hospitals were utilized in the study. It shows clearly that as a nation, there is much unmet need for C/S to improve maternal and child health. The WHO recommends rates of 10% to 15%⁶. Below 10% indicates unmet needs and above 15% does not add any more benefits.

Although 2-year period is short to establish a trend, yet it is obvious that the rate in the two years of this study shows a rising trend. The rate was 7.87% in 2021 and 13.66% in 2022 and the difference is statistically significant, $P = 0.008$. Eleje et al got a rising trend from 14.5% in 1999 to 26.9% in 2008¹⁵ so did Osonwa et al also got a rising trend²⁶. The rise in rate of C/S in this study may be because 2021 was the Covid-19 pandemic and patients avoided going to hospitals for fear of contracting the disease. Eleje et al. reported this decline in C/S rate in 2021²⁷. The increase in rate of C/S in 2022 could then be because Covid-19 had abated with resultant increase in use of hospital services. It may also be because mothers are accepting elective C/S more than previously. From this study the rate of elective C/S increased from 20.0% in 2021 to 30.4% in 2022 though this difference is not statistically significant.

The most common indication for C/S in this study is prolonged labor followed by obstructed labor. Hence, the combination of prolonged and obstructed labor accounts for 27 (31.4%) of the indications for C/S in this study followed by two previous scars, CPD and fetal distress. This agrees with the findings of Daniel and Sing¹⁷. The most common indication for C/S in Nnewi according to Eleje et al is previous scar¹⁵. This variation may be because in the center for this study, one previous scar is not an indication for C/S as long as the reason for the primary C/S is not a recurrent one. This is according to the guidelines of the Royal College of Obstetrics and Gynecology²⁸. Vaginal birth after C/S (VBAC) has also been recommended by some studies^{12,14}. Other studies found CPD followed by previous scar and fetal distress as major indications for C/S^{13,14,16}.

The most common complication in this study is wound sepsis, 4 (4.7%), followed by anemia that required blood transfusion 2 (2.3%). Blood transfusion is not a routine following C/S in this study center except if it is indicated by anemia before surgery or heavy primary hemorrhage during surgery. In this study only 2 patients needed and received blood transfusion. There were two intra uterine deaths prior to surgery and three fresh still births (FSB). The FSBs were as a result of severe fetal distress. The IUDs that had C/S were because they had previous scar and fear of uterine rupture informed choice of elective C/S to induction of labor for the IUD.

There was one maternal death due to disseminated intravascular coagulopathy, giving a case fatality rate of 1.16%. The three fetal losses from 86 C/S gives a fetal fatality rate of 3.49%. This is much lower than findings from other studies where case fatality rates and neonatal mortality rates are much higher^{14,16}. The higher mortality rate in these centers may be because they are referrals centers and those cases referred to them must have reached them too late for definitive intervention with better outcome to occur.

There is no significant difference in outcomes of elective and emergency C/S. This may be because emergency C/S were handled promptly and timely. Referral to tertiary hospitals creates delay and patients may reach the tertiary facility too late to receive good benefits from definitive intervention. The delay may be in the patient and relatives accepting and deciding to move to the referred center. There may also be another delay as a result of distance of the referral center from the referring hospital, availability and cost of transportation and poor roads and infrastructure. If private hospitals can provide comprehensive emergency obstetric care, few referrals will be necessary and the tertiary hospitals will have fewer emergencies and better outcomes. Comprehensive emergency obstetric care only requires the ability to (1) Administer parenteral antibiotics, (2) Administer uterotonic drugs (i.e. parenteral oxytocin), (3) Administer parenteral anticonvulsants for preeclampsia and eclampsia (i.e. magnesium sulfate), (4) Manually remove the placenta, (5) Remove retained products (e.g. manual vacuum extraction, dilation and curettage), (6) Perform assisted vaginal delivery (e.g. vacuum extraction, forceps delivery), (7) Perform basic neonatal resuscitation (e.g. with bag and mask), (8) Perform surgery (e.g. caesarean section), (9) Perform blood transfusion. A basic emergency obstetric care facility is one in which all functions 1–7 are performed. A comprehensive emergency obstetric care facility is one in which all functions 1–9 are performed²⁹. The study site for this research provides comprehensive emergency obstetric care.

Conclusion:

C/S rate is within the ideal rate recommended by the WHO. The most common indication for C/S is a combination of prolonged and obstructed labor. Most C/Ss come as emergency. Outcome of C/S is good because of availability of comprehensive emergency obstetric care. There is no difference in outcome of emergency C/S and elective ones.

Limitations

This is a cross sectional study from one private hospital only. The results may not be representative of all private hospitals.

Recommendation

It is recommended that private hospitals keep records of their practice and publish papers from such records. This will give the picture of our healthcare practice from the private sector. This will certainly affect our health indices since the private sector attends to more than 70% of healthcare needs of Nigerians but what is published in literature is mostly reports from tertiary hospitals that contribute a comparatively smaller percentage to healthcare delivery with respect to patient load.

All private health care facilities that do not provide comprehensive emergency obstetric services should endeavor to build up their capacities, through continuous staff trainings, recruitments and procurement of essential materials. This will reduce emergencies referred to teaching hospitals and improve outcomes of caesarian sections.

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Nil

Conflict of interest

One of the researchers is the medical director of Obinwanne Hospital and Maternity where the data were collected but the research was done honestly without bias.

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