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Prevalence, Indications and Outcomes of Cesarean Section Deliveries in Nigeria: A Four-Year Retrospective Review in Bowen University Teaching Hospital

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ABSTRACT

Background & aim: The prevalence of cesarean section as a mode of delivery is on a steady increase, it is, therefore, a good practice to perform periodic assessments of the procedure in various institutions. This study aimed to examine the prevalence, indications, and outcomes of cesarean section in a private teaching hospital in Nigeria.

Methods: This retrospective record review was conducted among mothers who delivered in Bowen University Teaching Hospital, Nigeria. Case records, maternity records, and theatre records of 978 women who delivered via cesarean section from June 1, 2018 to May 31, 2022 were retrieved. Data was collected from secondary sources using a self-structure checklist. SPSS version 20 was used to analyze data.

Results: A total of 2,558 deliveries were registered during the four years of the survey, out of which 978 (38.2%) were carried out via cesarean section. The mean age of mothers was 30.3±0.15years. The majority of the women were multi gravida accounting for 59.9%. The previous scar was the leading indication with 15.5%, followed by fetal distress and prolonged labor with 13.9% and 13.6%, respectively. Of the women who had cesarean sections, 152 (15.6%) exhibited adverse outcomes. The most adverse outcome was anemia, which accounted for 6.4%.

Conclusion: The prevalence of cesarean section was higher than the World Health Organization's recommended rate of 10-15%. Therefore, there is need for individualized care during antenatal visits, with an emphasis on reducing medicalization of pregnancy to decrease the necessity for unnecessary cesarean sections.

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Introduction

Cesarean Section (CS) is one of the most commonly performed surgical procedures in obstetrics and certainly one of the oldest operations in surgery (1). CS is a lifesaving obstetric surgery which may be necessitated in high risk pregnancies as well as in women with transmissible infections such as Human Immunodeficiency Virus (2). It is a procedure whereby the foetus, placenta and membranes are delivered through an incision in the abdominal wall and uterus (3). Cesarean section can either be performed as elective Cesarean section (ELCS) or emergency Cesarean section (EMCS). Elective Cesarean section has been considered both safer for the mother and the

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foetus compared to emergency Cesarean section (4).

Prevalence of Cesarean section has been increasing globally (5). According to the latest data from 150 countries, currently, 18.6% of all births occur by CS, ranging from 1.4 to 56.4%.[6] However, great variation exists among regions and countries, with an average of 5-25% in developed countries while the rate of Cesarean section is relatively low in developing countries (6). The overall proportion of Cesarean sections is 19% (14%-24%) for 26 selected studies in Sub-Saharan Africa (7). Nigeria is not excluded from the growing trend of increasing CS rate. Across Nigeria, the Cesarean section rate ranges 20.8% - 35.5% (8). The rate is estimated at 35.5% in the South West, Nigeria (9). A study carried out in North Western Nigeria revealed a Cesarean section rate of 11.3% (10). Another study carried at the University of Abuja Teaching Hospital showed that the rate of Cesarean section was 21.4% (1).

Indications for Cesarean section range from obstetric to present day social reasons with a growing debate over the latter (11). When CS is medically indicated, it can help reduce maternal/neonatal mortalities and morbidities including delivery complications (12). However, a non-medically indicated CS has no associated additional benefits for mothers and newborns, rather like any surgery, it carries both short-term and/or long-term health risks (13). In some countries, medical indications for Cesarean section has been replaced by mundane reasons such as social reasons, tokophobia, astrological reasons and on maternal requests (14). Studies showed that unnecessary prenatal interventions such as overuse of ultrasounds, electronic fetal monitoring, induction and augmentation of labor could lead to increased rate of CS (15, 16). In a study in the United States (17), 11.6% had non-medical indications for Cesarean -section, and 14.2% had medical indication for Cesarean -section. According to a study carried out in North-West Nigeria (10), the most common indication for CS was obstructed labour and previous CS.

Despite the safety of CS, the procedure, especially in low- resource settings still pose a challenge to the clinician as women and even neonate come down with adverse outcomes (14). In the neonate, CS could be associated with increased incidence of respiratory distress, high incidence of admission to the neonatal intensive care unit, prolonged hospitalization, low Apgar scores at birth, and transient tachypnoea of the new-born. According to a study carried out in South-South Nigeria (11), maternal outcomes reported as a result of CS include anaemia, pyrexia, and wound infection. Cesarean section has higher risks of maternal death when compared with normal vaginal delivery (18).

Studies around the world had shown the rates of Cesarean section to be on the increase (1). The increase in the global rate of cesarean deliveries has raised concerns among obstetricians worldwide, particularly when these procedures are performed for medically unjustifiable reasons (11). It is a good practice to perform periodic assessment of CS in tertiary institutions in order to identify need for improvement (4). There is paucity of information on the prevalence, indications and outcomes of CS in Bowen University Teaching Hospital. Identifying the indications and trend in prevalence for CS will suggest alternative interventions that may help to lower the CS rate. Findings may also serve as pointers to areas that need improvement. Hence, this study was carried out to determine the prevalence, indications and outcomes of Cesarean section in Bowen University Teaching Hospital, Ogbomoso, Oyo State, Nigeria.

Materials and Methods

The study adopted a retrospective record review design (19) among mothers who delivered in Bowen University Teaching Hospital (BUTH), Ogbomoso. The self-structured checklist was utilized to collect data from case records of patients, maternity records and theatre records of women who delivered via Cesarean section from the June 1, 2018 to May 31, 2022. The checklist was subjected to face and content validity. A test-retest study conducted among women who delivered in Ladoke Akintola University of Technology Ogbomoso revealed a Cronbach's alpha of 0.82. The data collected included parity of the mother (the number of deliveries), booking status (registered for antenatal care or not), maternal age, mode of deliveries (if delivery was spontaneous vagina delivery or caesarean

section), number of fetus (if it was multiple fetuses or not), and indication for CS (reasons for CS), maternal and neonatal adverse outcome from CS (complications resulting from the CS). The study was conducted at Bowen University Teaching Hospital (BUTH), formerly known as Baptist Medical Centre, Ogbomosho, located in the Ogbomoso North Local Government Area of Oyo State, Nigeria. The hospital is a tertiary health institution, which provide extensive healthcare services to the populace. It is the referral centre for all other hospitals in Ogbomoso and its environs.

Two research assistants were trained for the purpose of data collection. The details for each patient was checked for completion and consistency before it was entered into a spread sheet and analysed using SPSS version 20. Descriptive statistics was used. Results were presented using simple tables and figures with frequency and percentages. Pearson's Chi Square was used to assess the significant relationship between outcome of Cesarean section and the type of Cesarean section. A p-value less than 0.05 was considered to be statistically significant.

Results

The total number of deliveries recorded from June 2018 to May 2022 was 2,558 out of which 978 deliveries were via Cesarean section with a percentage of 38.2%. Of the 978 total number of deliveries via CS, 76% were emergency while 24% were elective.

Table 1. Social-Demographic Characteristics of women who had Cesarean Section

Variables	Frequency (%)
Age	
11 – 20	63 (6.4)
21 – 30	388 (39.7)
31 – 40	454 (46.4)
41 – 50	73 (7.5)
Total	**978 (100.0)**
	30.3±0.15
Educational level	
Primary	179 (18.3)
Secondary	235 (24.0)
Tertiary	564 (57.7)
Total	**978 (100.0)**
Religion	
Christian	861 (88.0)
Muslim	117 (12.0)
Total	**978 (100.0)**
Parity	
Primigravid	392 (40.1)
Multigravida	586 (59.9)
Total	**978 (100.0)**
Gestational age at Delivery	
25-30	50 (5.1)
31-35	118 (12.1)
36-40	716 (73.2)
41-45	94 (9.6)
Total	**978 (100.0)**
State of booking	
Booked	782 (80.0)
Un-booked	196 (20.0)
Total	**978 (100.0)**

In the study, it was determined that the majority of the women who had Cesarean section were within the age range of 31 – 40 (46.4%), with mean age of 30.3±0.15years. Most of the women had tertiary education with 57.7%. Majority of the women who had CS were Christians and booked with 88.0% and 80.0% respectively. More than three quarter of the women who had Cesarean section had their delivery during 36-40 weeks of gestation with 73.2% (Table 1).

Table 2. Indications for Cesarean Section

Variables	Frequency (%)
Maternal Request	31 (3.2)
Previous scar	152 (15.5)
Prolonged labour	133 (13.6)
Eclampsia	67 (6.9)
Malpresentation	84 (8.6)
IUFD	62 (6.3)
Multiple gestation	77 (7.9)
Fetal distress	136 (13.9)
Cephalopelvic disproportion	50 (5.1)
Placenta previa	72 (7.4)
Co-existing mass	25 (2.6)
Preterm contractions	61 (6.2)
Oligohydramnios and polyhydramnios	28 (2.9)
Total	**978 (100.0)**

From table 2, the most predominant indication for CS was previous scar with 15.5% followed by fetal distress and prolonged labour with 13.9% and 13.6% respectively.

In table 3,152 (15.6%) of the women who had Cesarean section exhibited adverse outcomes while 826 (84.4%) presented with no adverse

outcome. The most prevailing adverse outcome was anaemia which accounted for 6.4% followed by need for blood transfusion and postpartum haemorrhage with 2.3% and 2.2% respectively. Using the Chi Square test of statistics, since the p value (0.855) is more than 0.05, type of Cesarean section was not statistically related to the outcomes. Hence, outcomes of CS is independent of the type of CS.

Table 3. Outcomes of cesarean section in two groups of emergency and elective caesarean section

Outcomes	Emergency C/S	Elective C/S	Total	Chi-square test results
Anaemia	47 (4.8)	16 (1.6)	63 (6.4)	
Postpartum Haemorrhage	16 (1.6)	6 (0.6)	22 (2.2)	
Hypoglycaemia in the foetus	6 (0.6)	3 (0.3)	9 (0.9)	
Neonatal sepsis	8 (0.8)	4 (0.4)	12 (1.2)	
Delayed wound healing	3 (0.3)	2 (0.2)	5 (0.5)	
Weak cry at birth	8 (0.8)	1 (0.1)	9 (0.9)	
Blood Transfusion	21 (2.1)	2 (0.2)	23 (2.3)	
Infection	8 (0.8)	1(0.9)	9 (1.7)	
No Adverse outcome	626 (64.0)	200 (20.4)	826 (84.4)	
Total	**743 (76.0)**	**235 (24.0)**	**978 (100)**	**P=0.855**

Discussion

The mean age of the women who had CS was 30.3±0.15years, majority of them were between the ages of 31-40 years (46.4%). A study in a Nigerian Tertiary Hospital (18), showed that CS was more prevalent among women between the ages of 25-34 years (40.3%), in another study in Ethiopia (20), CS was prevalent among women aged 20–34 with 76.6%. This is expected because the age falls within the child bearing age of women. Booked patients accounted for a higher percentage (80.0%) than un-booked patients (20.0%) among the women who had CS, this is similar to the findings of a study conducted in Lagos (21), where booked patients accounted for 81.2%, and this is contrary to the findings in a Nigerian Tertiary Hospital (1), where CS was more prevalent among unbooked women (63.5%). CS was revealed to be more prevalent among multigravida with 59.9%, this is in contrast to the result of a study carried out in Eastern Nepal (22), where Primigravida had the highest rate of CS with 70.98%.

Of the 2,558 deliveries recorded from 1st June 2018 to 31st May 2022, a total of 978 deliveries were via Cesarean section, giving a CS rate of 38.2%. More than half of the CS deliveries were emergency with 76%. This could be because Bowen University Teaching hospital is a tertiary facility and serves as referral center for other secondary and primary health facilities. This is more than the recommended rate of Cesarean section by WHO of 10-15%. This is quite close to the findings of a study in a Nigerian teaching hospital (1), where the prevalence of CS was between 20-30%. This is also similar to the findings in Ethiopia (20) in Nigeria (21), and findings from a study in Sagamu in Nigeria (23), with 27.6%, 40.1% and 23.1% respectively, as they are all above the recommended rate by WHO. The report on the prevalence of cesarean section in this study is totally in contrast with what was reported in Nigeria (24), where South-West region had, CS prevalence of 4.7%. In a study in Ethiopia, (20) most of the CS were emergency with 90.4% which is similar to the findings of this study. This is also similar to findings of studies in Enugu and Ilorin with 93.7% and 91.5% respectively. This may be due to the fact that these are tertiary institutions which serve as referral centers to other facilities.

The most predominant indication of CS in this study was previous scar with 15.5% followed by fetal distress and prolonged labour with 13.9% and 13.6% respectively. This is similar with the report in North Western Nigeria (4), where previous scar accounted for 30.7%. Indications revealed in a study carried out in a Nigerian Tertiary Hospital (1), were cephalopelvic disproportion with 30.8%, followed by fetal distress with 23.6%. A study done in the South-South Nigeria (11), indicated Cephalopelvic disproportion with 27.8% and previous scar with 16.7% as the leading indication for CS, a similar study done in the South-East Nigeria

(25), revealed previous scar 21.5% and cephalopelvic disproportion 12.3% as the leading indications. These findings show that previous scar is a very common indication for CS. In a study in Eastern Nepal (22), the most common indications of CS were fetal distress (35.18%), followed by non-progression of labour (24.69%), failed induction (14.19%), and CPD (10.49%). In another study in in a Tertiary Care Hospital in Nepal (26) most common indication of Cesarean section was fetal distress (28%) followed by previous Cesarean section (18%). A study in Ethiopia (20), identified the leading indications for Cesarean birth as Cephalopelvic Disproportion (38.1%) and previous CS (18.9%).

Only 15.6% of the women who had Cesarean section in this study exhibited adverse outcomes. Majority of the women did not present with adverse outcome. Anaemia, need for blood transfusion and post-partum haemorrhage were the prevailing adverse outcome recorded. Similarly, in a study in a Nigerian Teaching Hospital (18) anemia was the most common complication/outcome of CS with 32.5%. Even though the risk of maternal death after Cesarean section is 5 times higher than normal vaginal delivery, there was no maternal or fetal death recorded from this study but in a study in a Nigerian Tertiary Hospital (1), 17 maternal deaths were reported and there were 2.9% perinatal deaths due to birth asphyxia following emergency Cesarean section. This is similar to the findings of a study in South-South Nigeria, (11) where 4 maternal deaths and 6 perinatal deaths were recorded. This is contrary to the study in Eastern Nepal (22), where no major maternal complications were noted. Statistical analysis revealed that outcome of Cesarean section is not dependent on the type of Cesarean section (p value 0.855), this could because there is a standard of procedure guideline in use irrespective of the type of cesarean section.

Study bias was possible since the population assessed represented mothers who delivered within a specific time frame. Furthermore, this study was limited to Bowen university teaching hospital alone.

The study retrospectively identified pattern of cesarean section and outcome reflecting an assessment of the procedure in this institution.

Conclusion

This research adopted a retrospective record review design, in which the target population were women who had delivered from June 1, 2018 to May 31, 2022 via Cesarean section either elective or emergency in Bowen university teaching hospital, Ogbomoso, Oyo state within the four years of survey. Result revealed the prevalence of Cesarean section of 38.2% being more than the recommended WHO standard of 10-15%. Major indications were previous scar, fetal distress and prolonged labour. Predominant outcomes were anaemia, need for blood transfusion and post-partum haemorrhage.

Declarations

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Conflicts of interest

Authors declared no conflicts of interest.

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Ethical considerations

Approval was obtained from the Ethics Committee of the Bowen University Teaching Hospital, Ogbomoso before the commencement of the study (Code of ethics: NHREC/12/04/2012).

Authors' contributions

All authors made a significant contribution to the different parts of the study and read and approved the final manuscript and agreed to be accountable for all aspects of the work.

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