Pattern of primary caesarean deliveries in a Nigerian tertiary hospital

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INTRODUCTION

Caesarean section (CS) is a life-saving obstetric surgery, which may be necessitated in high-risk pregnancies.1 It is recommended in situations in which vaginal birth presents a greater likelihood of adverse maternal or perinatal outcomes than normal.2 However, caesarean section is associated with a higher risk of complications, especially when performed without a clear medical indication.2 One of the most dramatic features of modern obstetrics is the relentless increase in caesarean section rate which is a major public health concern globally.3 The global rate of CS delivery is rising steadily and has reached a rate of 21.1% of all births in 2015 with an average annual increasing rate of 3.7% during 2000-2015.4

The world health organization (WHO) recommends an upper limit CS rate of 15% of all deliveries.5 The rising rate of CS indicates that this life saving intervention is being practiced higher than the expected level on the basis of obstetric indications in many countries.4 CS can also be costly and places poor families under extreme financial pressure in low- and middle-income countries.
Primary CS is CS done for the first time in a pregnant woman and it has become a major driver of the total caesarean rate. Understanding the population trends in primary caesarean section rates and potential drivers of these trends will provide important insights to target areas for reducing overall caesarean section rate. This study aimed to determine the primary CS rate, pattern and associated factors in Lagos State University Teaching Hospital, Lagos, Nigeria.

METHODS

This was a retrospective, cross-sectional study in which data from medical records of 645 women who had primary CS between 1st of January 2015 and 31st of December 2017 were retrieved. Records of pregnant women who had abdominal surgical delivery of their babies at gestational age of less than 28 weeks were not included.

Data were obtained by the researchers from the antenatal, labour ward and theatre registers of the Lagos State University teaching hospital using a structured proforma designed for the study. The proforma included information on socio-demography, booking status, past obstetric history, antenatal history, record of events of labour, type of caesarean delivery (emergency or elective), gestational age at delivery and post-delivery feto-maternal outcomes.

Data analysis was done using SPSS version 23 (IBM). Categorical variables were presented in frequency and percentages. Confidentiality of retrieved data was ensured and ethical approval was not deemed mandatory by the institutional ethical review board because the study was essentially a retrospective review of existing medical records.

RESULTS

Six hundred and forty-five (80%) of women with complete data who had primary CS during the study period had their data analysed (Figure 1). Primary CS accounted for more than 50% of all the CS done per year during the study period and a primary CS rate of 16.7% over the study period (Table 1). Total CS rate was 30.6% (Table 1).

Table 1: Distribution of primary caesarean section by year and type.

| Year | Total no. of deliveries | Total CS n, (CS rate, %) | Primary CS n, (% of total CS) | Primary CS (% of primary CS) | Primary CS rate, (%) |
|------|------------------------|-------------------------|-------------------------------|-----------------------------|---------------------|
|      |                        | Total CS n, (CS rate, %) | Primary CS n, (% of total CS) | Primary CS (% of primary CS) | Emergency          |
| 2015 | 1013                   | 302 (29.8)               | 164 (54.3)                    | 42 (25.6)                   | 122 (74.4)         | 16.2               |
| 2016 | 1327                   | 421 (31.7)               | 241 (57.3)                    | 66 (27.4)                   | 175 (72.6)         | 18.2               |
| 2017 | 1524                   | 461 (30.2)               | 240 (52.1)                    | 62 (25.8)                   | 178 (74.2)         | 15.7               |
| Total| 3864                   | 1184 (30.6)              | 645 (16.7)                    | 170 (26.4)                  | 475 (73.6)         | 16.7               |

CS-Caesarean section, Total CS=Primary CS and repeat CS.

Primary CS was commonest among women of age group 30-39 years (50.1%) and women with no prior parous experience (58.6%) (Table 2). The commonest indication for primary CS was poor progress in labour, which occurred in 170 women (26.4%), followed by suspected foetal distress in 94 women (14.6%) and hypertensive disease in pregnancy in 91 women (14.1%) (Table 3).

Of the leading indications for primary CS, majority of the women (89.4%) who had poor progress of labour developed it in the first stage of labour. In women who had primary CS on account of the suspected foetal distress, intermittent auscultation of foetal heart rate (51.7%) was more commonly used than continuous electronic foetal heart rate monitoring (48.3%) to make a diagnosis of suspected foetal distress (Table 4). Severe pre-eclampsia/eclampsia accounted for 80.2% of indications for primary CS due to hypertensive disorders of pregnancy as shown in the Table 4.

Only 2.6% of women (17) who had primary CS remained on admission till post-operative day 10, perinatal mortality was 1.9% and maternal mortality was 0.6% (Table 5). Commonest complication observed in women who had primary CS was wound infection/dehiscence which occurred in 12.1% of the study population (Table 6).
Table 2: Socio-demographic characteristics of women who had primary caesarean section (n=645).

| Variables            | N   | %   |
|----------------------|-----|-----|
| **Age group, (years)** |     |     |
| <20                  | 10  | 1.6 |
| 20-29                | 267 | 41.3|
| 30-39                | 323 | 50.1|
| ≥40                  | 45  | 7.0 |
| **Parity**           |     |     |
| 0                    | 378 | 58.6|
| 1                    | 115 | 17.8|
| 2-5                  | 145 | 22.5|
| >5                   | 7   | 1.1 |
| **Ethnic group**     |     |     |
| Yoruba               | 292 | 45.3|
| Igbo                 | 284 | 44.0|
| Hausa                | 18  | 2.8 |
| Others               | 51  | 7.9 |
| **Religion**         |     |     |
| Christianity         | 410 | 63.6|
| Islam                | 201 | 31.3|
| Traditional          | 34  | 5.3 |
| **Marital status**   |     |     |
| Married              | 639 | 99.1|
| Single               | 6   | 0.9 |
| **Occupation**       |     |     |
| Housewives           | 130 | 20.2|
| Civil servants       | 80  | 12.4|
| Professionals        | 116 | 18.0|
| Traders              | 264 | 41.0|
| Applicants           | 10  | 1.54|
| Students             | 32  | 5.0 |
| Others               | 11  | 1.7 |
| **Booking status**   |     |     |
| Booked               | 574 | 89.0|
| Un-booked            | 71  | 11.0|

Table 3: Indications for primary caesarean section (n=645).

| Indications                             | N   | %   |
|-----------------------------------------|-----|-----|
| Poor progress in labour                 | 170 | 26.4|
| Cephalopelvic disproportion             | 150 | 23.3|
| Obstructed labour                       | 20  | 3.1 |
| Failed induction                        | 32  | 5.0 |
| Foetal distress                         | 94  | 14.6|
| Abnormal presentation                   | 63  | 9.8 |
| Hypertensive disease in pregnancy       | 91  | 14.1|
| Foetal anomalies                        | 6   | 0.9 |
| Multiple gestation                      | 19  | 2.9 |
| Previous uterine scar                   | 3   | 0.5 |
| PMTCT                                   | 14  | 2.2 |
| Suspected foetal macrosomia             | 38  | 5.9 |
| Obstetrics factor                       | 57  | 8.8 |
| Elective                                | 42  | 6.5 |
| Others                                  | 16  | 2.5 |

Table 4: Common indications of primary CS in the study.

| Variables                  | Frequency | %   |
|----------------------------|-----------|-----|
| Poor progress of labour, (n=170) |           |     |
| First stage                | 152       | 89.4|
| Second stage               | 18        | 10.6|
| Suspected foetal distress by, (n=94) |       |     |
| Intermittent auscultation   | 55        | 51.7|
| Continuous EFM             | 39        | 48.3|
| Hypertensive disorders, (n=91) |           |     |
| Severe pre-eclampsia/eclampsia | 73      | 80.2|
| Severe PIH                 | 18        | 19.8|

Table 5: Maternal and foetal outcomes of women who had primary CS.

| Variables                | Frequency | %   |
|--------------------------|-----------|-----|
| Perinatal mortality      |           |     |
| Yes                      | 12        | 1.9 |
| No                       | 633       | 98.1|
| Post-operative complications |         |     |
| Yes                      | 162       | 25.2|
| No                       | 482       | 74.8|
| Maternal mortality       |           |     |
| Yes                      | 4         | 0.6 |
| No                       | 641       | 99.4|
| Duration of hospital stay (days) |     |     |
| ≤5                       | 291       | 45.1|
| 6-10                     | 337       | 52.3|
| >10                      | 17        | 2.6 |

Table 6: Complications in women who had primary CS.

| Complications              | Frequency | %   |
|----------------------------|-----------|-----|
| Subtotal hysterectomy      | 2         | 0.2 |
| Postpartum hemorrhage      | 8         | 1.3 |
| Wound sepsis/dehiscence    | 78        | 12.1|
| UTI                        | 36        | 5.6 |
| Cardiac arrest (resuscitated) | 2      | 0.2 |
| Need for blood transfusions | 33       | 4.1 |
| Maternal death             | 4         | 0.6 |
| Total                      | 163       | 25.3|

**DISCUSSION**

Primary caesarean section usually determines the future obstetric course of any woman and therefore should be avoided whenever medically possible. The overall caesarean section rate in this study was 30.6% and a
primary CS rate of 16.7%. The CS rate found in this study is much higher than 15%, recommended by WHO.\textsuperscript{10} The rate found in this study compares to rates reported in some developed countries such as USA (32.8%), Rome (44%) and Australia (31%).\textsuperscript{13} Local studies in Nigeria have cited caesarean section rate to vary from 10.3% to 34.5%, 18% reported in Jos, Nigeria 11.8% reported in Maiduguri, Nigeria, 21% in Abuja, Nigeria and 19.8% reported in Calabar, Nigeria.\textsuperscript{9-11,12} However, most of these figures are institutional based and may not reflect the true picture in the general population because these centers are referral centers.

As regards parity, we found that 58.5% of women who had primary CS had no prior parous experience. This is in keeping with findings in other studies that noted CS to be more likely performed in primiparous.\textsuperscript{9,13,14} We found that poor progress in labour due to cephalopelvic disproportion was the commonest indication for primary CS followed by suspected foetal distress and hypertensive disorders of pregnancy. Daniel et al similarly noted a high rate of poor progress in labour from cephalopelvic disproportion which was particularly prevalent in primiparous women.\textsuperscript{9} Batieha et al in Jordan noted that foetal distress was the commonest indication for emergency CS in their study.\textsuperscript{13} Isah et al in Abuja also noted similar pattern of leading indications for CS, they reported that cephalopelvic disproportion was the most common indication (30.8%) followed by foetal distress (23.6%) and severe pre-eclampsia/eclampsia (10.9%).\textsuperscript{12} Ugwu et al in Enugu reported cephalopelvic disproportion and suspected foetal distress as the 2\textsuperscript{nd} and 3\textsuperscript{rd} commonest indications for CS respectively in their study.\textsuperscript{15} This similar pattern of leading indications of CS in Nigeria would therefore suggest that, for significant impact, efforts at reducing caesarean section rates should seek to address the prevention and proper diagnosis and management of poor progress in labour, suspected foetal distress and hypertensive disorders in pregnancy.

We observed that the proportion of women (51.7%) who had primary CS on account of suspected foetal distress with the diagnosis made via intermittent auscultation was slightly higher than the proportion of women (48.3%) who had similar diagnosis made via continuous external foetal heart rate monitoring using the cardiotocograph machine (Table 4). It thus appears that the diagnosis of suspected foetal distress was more often made by intermittent auscultation. This may imply that, in the absence of resources to perform the definitive foetal scalp sampling for confirmation of foetal distress, prompt sequential reassessment of cases of suspected foetal distress, diagnosed by intermittent auscultation, with a continuous external foetal heart rate monitor may further clarify the diagnosis of foetal distress.

The surgical complication rate in this study was 25.2% (Table 5). We observed a perinatal loss rate of 1.9% and maternal mortality rate of 0.6%. Post-operative wound infection and/or dehiscence was the most prevalent post-operative complication occurring in 12.1% of women who had primary CS. This may be explained by the fact that a large proportion (73.6) of the women studied had emergency CS (Table 1). Pant et al in Sokoto, Chama et al in Maiduguri and Okonta et al in benin reported post CS complication rate of 20.4%, 39.3% and 44.4% respectively with hemorrhage and sepsis being the leading complications post CS.\textsuperscript{16-18} Our differing post-operative complication pattern may be explained by the limitation of our study to women who had primary CS.

\textbf{Limitations}

This study could not determine or quantify risk factors for primary CS due to its observational, retrospective and non-comparative nature.

\textbf{CONCLUSION}

In conclusion, primary CS rate is relatively more common among primiparous women. Cephalopelvic disproportion, suspected foetal distress and hypertensive disorders of pregnancy are the leading indications for primary CS in Nigeria. Most hospitals in developing countries do not confirm fetal distress in labour due to lack of resources for the confirmation of fetal distress in labour and CS is a usual recourse once fetal distress is suspected. Availability of resources to confirm fetal distress may likely reduce the rate of CS from suspected fetal distress, a leading cause of primary CS identified in this study.

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