



(RESEARCH ARTICLE)



## Audit of caesarean deliveries in ESUT Teaching Hospital (ESUTH) Enugu: A 3-year review

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### Abstract

**Background:** Caesarean delivery or abdominal delivery is a common intervention in current obstetric practice which has significantly reduced maternal and neonatal morbidities and mortality. The World Health Organization (WHO) in 1985 pegged the acceptable rate at 10-15% but the rate of caesarean sections has been increasing in both the developed and developing countries. However, the rates have been exceeded in many developed countries while in the developing countries with a lot of unmet needs, the rates are quite low. When absolutely indicated, the rate should not prevent the timely recourse to the procedure which is life-saving.

**Aim:** The aim was to determine the rate of caesarean section in ESUT Teaching Hospital over a 3-year period.

**Materials and Method:** This was a retrospective study of all the caesarean sections done in ESUT Teaching Hospital Enugu from December 31, 2020 to January 1, 2018. The necessary data was collected from the registers of the theatre and labour ward of ESUT Teaching Hospital and patients' case notes using a structured proforma.

**Statistical Analysis:** Data collected from the study was analyzed with the Statistical Package for Social Sciences (SPSS) computer software for Windows version 20.0. Results were presented using simple percentages, frequencies and tables.

**Result:** Out of the 4719 deliveries in the centre over the period, the caesarean rate was 29.6% out of which 73.7% were booked; 26.3% unbooked; 59.2% were emergencies and 40.8% elective. The major indications were previous caesarean 20.2%, hypertensive diseases in pregnancy 14.6% and poor progress of labour 11.4%. Maternal complications were PPH, 8.4%; UT injuries, 2.9% and maternal death, 0.5%. The neonatal intensive care admission was 2.49% and neonatal death, 8.5%.

**Conclusion:** There is a relatively high caesarean section rate in ESUT Teaching Hospital when compared with the Nigerian national figures but this is still lower than what is obtainable in the developed countries.

**Keywords:** Audit; Caesarean Deliveries; ESUTH; Enugu

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## 1. Introduction

Caesarean delivery is defined as the delivery of a foetus through a surgical incision made through the abdominal wall (laparotomy) and the uterine wall (hysterotomy). The prevalence and indications for the procedure have been changing over time both in the developing and the developed countries as obstetric practice evolves while the safety profile of the procedure has continued to increase. It can be done as an emergency or elective/scheduled. Some of the indications include but not limited to multiple pregnancies, breech presentations, abnormal lies, obstructed labour as well as women with transmissible infections like active genital herpes and HIV/AIDS [1,2].

The recommended reference range for the rate of caesarean section is 10-15% [3] but this rate has been exceeded in many countries such as the USA up to 32% [4]. Rates below 5% may indicate inadequate availability of the services whereas above 15% may indicate over-use of the procedure [5]. The rates are quite high in countries like USA and other developed countries where about 1 in 3 babies are delivered through caesarean section and some private facilities in Brazil have a rate as high as 90% [5,6].

The caesarean section rate in Nigeria has been found to be lower than the lower limit of 10% over time. In 2008 the rate was found to be 2% of all births and 2.1% in 2013 with the western region having the highest prevalence of 4.7% [7,8,9]. This is even lower than the rates in the neighboring countries of Ghana, 13%, [10] Lesotho, 9.7% [11], and Uganda, 5.22% [12].

However, other studies differ in their outcome of the caesarean rates in Nigeria. The rates ranged from 6.4% to 32.2% [13,14,15]. In a more recent study done in Usman Danfodio University Teaching Hospital, Sokoto, [16] the caesarean section rate was 11.3%, out of which teenage mothers constituted 7.5%, elderly, 0.8%. About 67.9% of these accessed antenatal care in the centre whereas 32.1% received antenatal care elsewhere. It was also found that the most common indications for the procedure were prolonged obstructed labour and preeclampsia/eclampsia 10.7% and the least was malpresentations 1.5%. Another study revealed a rate of 21.4% most of which were emergency sections, 80.2% and elective, 19.8%. It also found out that the rate of caesarean was more among the unbooked 63.5% [17], a total of 17 maternal deaths with a case fatality rate of 0.8% was recorded and 2.9% perinatal deaths due to birth asphyxia following emergency sections.

The above studies reveal the significance of caesarean delivery in the current obstetric practice and the varying rates and outcomes in different countries and regions within the same country.

There has not been any study in the past to analyze the caesarean section rate and pattern in our hospital which serves as a major referral centre for all the south-eastern states, hence, the need for this study.

### *Aims of the study*

The aim was to determine the rate of caesarean section in ESUT Teaching Hospital over a 3-year period.

### *Objectives of the study*

The objectives were to determine the:

- Rate
- Indications
- Fetal outcomes
- Maternal outcomes

of caesarean sections done in ESUT Teaching Hospital Enugu from December 31, 2020 to January 1, 2018.

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## 2. Material and methods

This was a retrospective study of all the caesarean deliveries in ESUT Teaching Hospital Enugu from December 31, 2020 to January 1, 2018. All the caesarean deliveries carried out in the centre within the period of the study as recorded in the registers and casebooks were analyzed. For the purposes of this study neonatal asphyxia was assigned to babies with Apgar scores below 7 at 5<sup>th</sup> minute postpartum. Relevant data was extracted from the labour ward and theatre registers and patient case files using a proforma.

## 2.1. Study area/centre

The study was carried out in ESUT Teaching Hospital, Enugu, a state owned tertiary hospital in the capital of Enugu state, South-East, Nigeria. About 1500-2000 women are delivered per annum in the centre. Enugu state is one of the five states in the South-East geopolitical zone of Nigeria. It was created in 1991 from the old Anambra state. It lies partly within the semi-tropical rain forest belt of the south and has an area of about **7,161km<sup>2</sup>**. It shares borders with Abia State to the South, Ebonyi State to the East, Benue State to the North-East, Kogi State to the North-West and Anambra State to the West. It has a population of approximately 3.3 million which are predominantly Igbo with pockets of other tribes [18].

## 2.2. Data analysis

Data collected from the study was analyzed with the Statistical Package for Social Sciences (SPSS) computer software for Windows version 20.0. Results were presented using tables, frequencies, and percentages.

## 3. Results

From the delivery register of the hospital, the total number of deliveries both vaginal and caesarean over the 3-year period under study was 4719. The number of caesarean deliveries over the same period was 1399. The caesarean rate in the centre over the period was 29.6%.

**Table 1** Demographic distribution of patients

| Demographic variables     |                | Frequency | Percent (%) |
|---------------------------|----------------|-----------|-------------|
| Age (years)               | 18-28          | 420       | 30          |
|                           | 29-39          | 942       | 67.4        |
|                           | ≥40            | 37        | 2.6         |
| Marital status            | Single         | 140       | 10          |
|                           | Married        | 1165      | 83.3        |
|                           | Divorced       | 86        | 6.1         |
|                           | Widow          | 8         | 0.6         |
| Educational qualification | Primary        | 240       | 17.2        |
|                           | Secondary      | 648       | 46.3        |
|                           | Tertiary       | 511       | 36.5        |
| Occupational status       | Employed       | 912       | 65.2        |
|                           | Unemployed     | 368       | 34.8        |
| Booking status            | Booked         | 1031      | 73.7        |
|                           | Unbooked       | 368       | 26.3        |
| Parity                    | Nullipara      | 413       | 29.5        |
|                           | Primipara      | 482       | 34.5        |
|                           | Multipara      | 447       | 31.9        |
|                           | Grandmultipara | 57        | 4.1         |

**Table 2** Types of caesarean section done

| Type of caesarean section | Frequency | Percent (%) |
|---------------------------|-----------|-------------|
| Elective                  | 571       | 40.8        |
| Emergency                 | 823       | 59.2        |

**Table 3** Indications for the caesarean sections

| Indications                                  | Frequency | Percent |
|--|-----------|---------|
| Previous caesarean sections                  | 282       | 20.2    |
| Antepartum haemorrhage                       | 44        | 3.1     |
| Hypertensive diseases in pregnancy/eclampsia | 160       | 11.4    |
| Failed induction                             | 22        | 1.6     |
| Poor progress of labour/prolonged labour     | 205       | 14.6    |
| Fetal distress in labour                     | 98        | 7.0     |
| Postdatism/prolonged pregnancy               | 19        | 1.4     |
| Abnormal lies/presentations                  | 39        | 2.8     |
| Poor biophysical profile                     | 25        | 1.9     |
| HIV infection                                | 8         | 0.6     |
| Intrauterine growth restriction              | 14        | 1.0     |
| Failed VBAC                                  | 34        | 2.5     |
| Abruptio placentae                           | 21        | 1.5     |
| Macrosomia                                   | 83        | 5.9     |
| Obstructed labour                            | 88        | 6.3     |
| Placenta previa                              | 105       | 7.5     |
| Others                                       | 152       | 10.8    |
| Total  | 1,399     | 100     |

**Table 4** Maternal outcomes

| Variables                  |     | Frequency | Percent (%) |
|----------------------------|-----|-----------|-------------|
| Anaesthetic complications  | Nil | 1394      | 99.6        |
|                            | Yes | 5         | 0.4         |
| PPH                        | Nil | 1281      | 91.6        |
|                            | Yes | 118       | 8.4         |
| Urinary tract(UT) injuries | Nil | 1358      | 97.1        |
|                            | Yes | 41        | 2.9         |
| Maternal death             | Nil | 1392      | 99.5        |
|                            | Yes | 7         | 0.5         |

**Table 5** Fetal outcomes

| Variables                         |     | Frequency | Percent (%) |
|-----------------------------------|-----|-----------|-------------|
| Neonatal intensive care admission | Nil | 1050      | 75.1        |
|                                   | Yes | 349       | 24.9        |
| Perinatal death                   | Nil | 1280      | 91.5        |
|                                   | Yes | 119       | 8.5         |

#### 4. Discussion

From this study the caesarean section rate in our centre was 29.6% which is higher than the recommended range of 10-15% [3]. This relatively higher rate may be due to the strategic role played by the centre as a referral hospital for many peripheral hospitals and adjoining states that usually refer complicated and prolonged labour cases to the centre with consequent higher rates of caesarean deliveries. It may not necessarily indicate over-use of the procedure in the centre.

This rate was quite higher than rates found in different parts of Nigeria viz: 2% [7], 2.1% [8], with western region having relatively higher prevalence of 4.7% [10]. These figures were quite old when compared with this study and may explain the differences. It is likely that the rates might be higher in those places currently as provision of health facilities; availability and acceptance of caesarean section continue to improve. When compared with a more recent study done in Sokoto the caesarean section rate was found to be 11.3% [16]. Further analysis showed that the most common indication from the study in Sokoto was preeclampsia/eclampsia 10.7%, while the least indication was malpresentations 1.5% as against our study in which the most common indication was previous caesarean section 20.2%, followed by poor progress of labour 14.6%, then preeclampsia/eclampsia 11.4% while the least was HIV infection in pregnancy (0.6%). This study was done in 2016 in a tertiary, referral hospital like our centre but in a different geopolitical zone with different population in all demographics. This may account for the differences in the results above.

Another study in a similar hospital in Abuja, north-central Nigeria within the same period [17] revealed a caesarean rate was 21.4% most of which were emergencies(80.2%) and elective 19.8%, 63.5% of the women were unbooked with 0.8% and 2.9% maternal and neonatal mortalities respectively; whereas in our study, the rate was 29.6% similar to the one above but differed in the type of caesarean in which case 59.2% were emergencies and 26.3%, unbooked. These differences could be due to the diverse locations of the study centres with different population demographics. Also, we had a 0.5% maternal and 8.5% neonatal mortalities. While we had similar maternal mortality rate, the differences in the neonatal mortality could be due to differences in the salvage rates in the newborn units of the two centres.

The lower rates recorded in other African countries such as Ghana (12.8%) [10] Lesotho (9.7%) [11] and Uganda (6%) [12] may be due to poor state of the health facilities in those countries resulting in under-use of the procedure or due to the fact that those were national figures as against the result from this study which was a hospital-based study.

The prevalence of caesarean section in the public and private insured mothers in Florida by Puro N et al was estimated as 18.87% [19]. This was lower than that gotten from our study which was 29.6%. The study revealed that higher rate of caesarean section was associated with diabetes, hypertension and expectant mothers being over 35 years [19]. However, the caesarean rate across the United States was approximately 32% [19].

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#### 5. Conclusion

There is a relatively high caesarean section rate in ESUT Teaching Hospital when compared with the Nigerian national figures but this is still lower than what is obtainable in the developed countries

##### *Recommendation*

The facilities for caesarean delivery should be made much more available to meet the need of our societies and reduce the high maternal mortalities prevalent in sub-Saharan Africa and the other developing countries.

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#### Compliance with ethical standards

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##### *Disclosure of conflict of interest*

We wish to state that there was no conflict of interest encountered in the course of this study and its write-up.

### *Statement of informed consent*

This was a retrospective study in which data was obtained from case files of patients delivered in the department and the their registers, therefore, no consent was required

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