

# Cesarean section in Ahmadu Bello University Teaching Hospital Zaria, Nigeria: A five-year appraisal

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## ABSTRACT

**Objective:** In 1985, the WHO recommended an optimum Cesarean section (CS) rate of 10–15% and stated that there was no justification for any region to have higher rates. The global increase in CS rate is causing concern and it is a major public health issue. Our objective is to appraise the CS intervention, observe trend, and proffer solutions.

**Materials and Methods:** All relevant clinical data from the patients delivery records in Ahmadu Bello University Teaching Hospital (ABUTH) Zaria over the period 2010–2014 were pooled and used to analyze the clinical information.

**Results:** There were a total of 9,388 deliveries during the period out of which 2,254 were CS, giving a rate of 24.5%. The mean age and parity of the study groups were  $30.6 \pm 4.8$  years and  $1.9 \pm 1.6$ , respectively. A total of 288 (12%) of them were done as elective. Most of the CS was done due to previous scar, pre-eclampsia/eclampsia. The maternal mortality rate (MMR) during this period was 870/100000 live births, the CS-related mortality was 339/100,000, and the perinatal mortality (PM) was 43.9/1000 live births.

**Conclusion:** The CS rate, the MMR, and PM are all high and the indications show that alternative interventions can be used to reverse the ugly trend but there is a need for training.

**Key words:** Cesarean section; rate; maternal mortality; perinatal mortality; indications; trend and training.

## Introduction

Cesarean section (CS) is the commonest major obstetrics surgery performed all over the world.<sup>[1,2]</sup> In 1985, the WHO consensus conference recommended an optimum CS rate of 10–15% and stated that there was no justification for any region in the world to have higher rates than this.<sup>[1,2]</sup> This was arrived at based on estimates of national CS rates and maternal mortality rate (MMR), and perinatal mortality (PM) rates, in various regions.<sup>[1,2]</sup>

Vaginal delivery represents the safest route for the fetus and newborn in the first and subsequent pregnancies. It is associated with fewer risks, shorter duration of admission,

it is cheaper and encourages earlier and better bonding between mother and infant and in Nigerian women due to economic and socio-cultural reasons, vaginal delivery is the preferred method of delivery.<sup>[3]</sup>

CS is the delivery of the fetus, placenta and membranes through abdominal and uterine incisions, from the age of viability for extrauterine existence.


CS is a major obstetric intervention whose rate has continue to rise not only in Nigeria but all over the world.<sup>[1-4]</sup> With

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the advent of regional anesthesia, safer blood transfusion services, and potent antibiotics, CS has become safer, but may not be as safe as vaginal delivery, even though it has contributed immensely to improved obstetric outcome throughout the world, despite this there is a growing concern over the rising rate of cesarean deliveries.<sup>[1-5]</sup> There are varieties of maternal, fetal and feto-maternal indications, recently women's wishes and preferences have contributed significantly to the rising rate of CS.<sup>[1-5]</sup> It is believed that careful examination of the indications and trend in prevalence for CS may give clues of alternative interventions, that may help to lower the CS rate; this informed our review.

## Materials and Methods

This is a hospital-based retrospective study of all CS performed in the Obstetrics and Gynecology department of Ahmadu Bello University Teaching Hospital (ABUTH) Zaria, North Western Nigeria. ABUTH is a tertiary health center; it is the oldest teaching hospital in Northern Nigeria. It receives referral from all the northern states and has 730 beds. In ABUTH, active management of labor is practiced using the plain composite partograph for all parturients in labor. Permission was obtained from the ethical committee to enable us have access to the records of patients. The case notes, delivery, and theatre records over a period of five years (2010–2014) were obtained and reviewed. Coding protocol was established by the team before chart abstraction. Abstraction forms were designed *a priori* and were tested and revised before the abstraction of full data.

All relevant clinical data from the patients delivery records over a period of five years (2010–2014) were pooled, entered into the computer, and analyzed using SPSS version 20. The results are presented in tables as frequencies and percentages and charts.

## Results

A total of 9,388 deliveries were conducted during the study period; 2254 of these were CS, giving a CS rate of 24.5%. The mean age and parity of the study groups were  $30.6 \pm 4.8$  years and  $1.9 \pm 1.6$ , respectively. Subjects' ages ranged from 15 to 49 years and parity ranged from 0 to 14.

Table 1 shows the frequency and indication for CS by age group. Previous scar accounted for 488 (21.7%); 24.6% of these were in the age group 30–34 years while 2.2% were in the age group of 15–19 years. Three hundred and eighty one (16.9%) CS were performed on account of pre-eclampsia/

eclampsia; out of which the major contributor is the age group 15–19 years where it accounted for 53% of the indication for C/S in this age group. A total of 345 (15.3%) CS were performed for malpresentation/malposition, and majority 35.6% were in the age group 25–29 years, while the age group 15–19 years accounted for only 3%, also about 80% of these were breech presentation. Presumed fetal distress accounted for 316 (14%) while obstructed labor (OL) accounted for 206 (9.1%); the age group 15–19 years accounted for 14% of OL cases. One hundred and forty one (6.2%) of the CS were done for antepartum hemorrhage (APH), the highest incidence of 17% of the APH cases was amongst those 40 years and above. The age group 25–34 years accounted for more than 60% of the CS. About 87% of the interventions were done as emergencies even though majority of the subjects (89.4%) were booked.

Figure 1 is a bar chart showing the rising trend in the rate of cesarean section from 20% in 2010 to about 40% in 2014. Figure 2 shows an increase in rate of repeat CS from 13% in 2010 to about 36% in 2014. Figure 3 shows indication for CS based on maternal age. The MMR during this period was 870/100,000 live births, and CS-associated mortality was 339/100,000 live births (10%), while PM was 43.9/1000 live births.

## Discussion

Like in most recent studies,<sup>[1-3]</sup> the CS rate in our study of 24.5% is high and the rate overtime has risen. The rate was consistently above the 15% rate recommended by WHO, over the five-year study period.

Fifteen years ago, a CS rate of 10.2% was reported in this same center, in contrast to 24.5% in this study.<sup>[4,6]</sup> This rate is higher than reported in a recent study in kano,<sup>[7]</sup> Gombe,<sup>[8]</sup> and Jos<sup>[9]</sup> Nigeria, respectively. Reasons for these observations could be changing indications, such as social, repeat CS, and

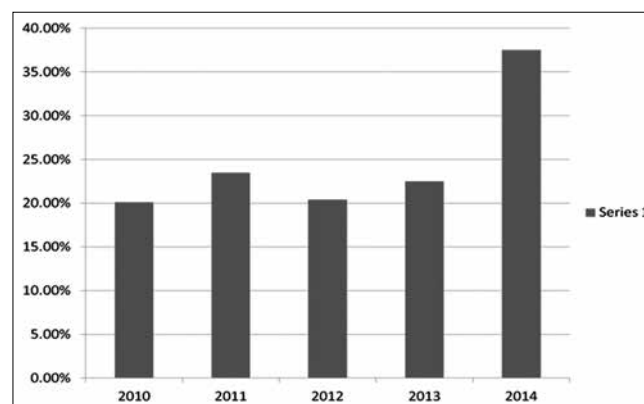
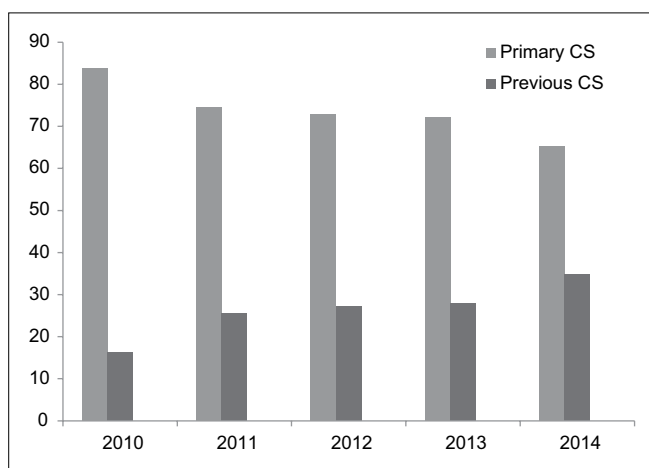


Figure 1: Trend in the rate of cesarean section over the study period

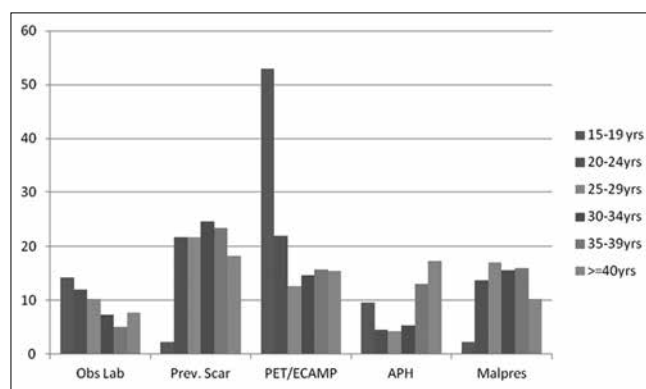
**Table 1: Indication for CS by age group**

Indication	f (%)	15-19 years	20-24 years	25-29 years	30-34 years	35-39 years	>=40 years
Obstructed labour	206 (9.1)	13	48	74	51	12	8
Failure to progress	56 (2.4)	4	6	5	36	5	-
Cephalopelvic disproportion	99 (4.3)	6	17	39	23	7	7
Failed induction of Labour	85 (3.8)	-	21	29	27	3	5
Antepartum heamorrhage	141 (6.2)	7	18	30	37	31	18
Malpresentation/Malposition	345 (15.3)	2	55	123	110	38	17
Previous scar	488 (21.7)	2	87	153	173	55	19
Fetal distress	316 (14.0)	15	56	124	85	29	7
Pre-eclampsia/Eclampsia	381 (16.9)	49	89	91	103	37	16
Twins	118 (5.2)	9	16	44	29	14	6
Others	18 (0.8)	1	2	1	4	4	6
Total	2254 (100)	92 (4.1%)	401 (17.8%)	719 (31.9%)	702 (31.1%)	236 (10.5%)	104 (4.6%)

**Figure 2: Trend in Primary and Previous CS as percentage of total for each year**

recourse for CS at the slightest indication because of fear of litigation, furthermore dearth of skills in external cephalic version, breech delivery, instrumental delivery, vaginal birth after cesarean section (VBAC), symphysiotomy, and destructive operations among the trainees could amongst others account for the reason for the increase and rising trend. The rate could be higher in fee-for-service providers as suggested by a study in Durban, South Africa, where it was found that 50% of women were more likely to have a CS than those that deliver in the public sector.<sup>[9]</sup>

We also observed that the commonest indication changed from preeclampsia/eclampsia in 2010 to previous scar over the last three years of the study period. This may be as a result of improved management of preeclampsia/eclampsia with the advent of MgSO<sub>4</sub>, which has revolutionized the management of preeclampsia/eclampsia and also due to reduction in teenage pregnancies who are more prone to preeclampsia/eclampsia (4.1% of the patients were teenagers) [Figure 2]. The increasing rate of CS cumulatively led to the need for repeat CS compounded by performing of repeat CS

**Figure 3: Indication for CS based on maternal age**

in cases of previous scar without careful selection of patients for trial of VBAC as a result of impatience on the part of the obstetricians and inadequate/lack of CTG and intrauterine catheters to monitor labor objectively.

Most (63%) of the subjects were aged 25 to 34 years and contrary to perceived views, very few (4.1%) were less than 20 years of age. This is in line with the age of optimal fertility and decrease in teenage pregnancy over the years in this centre, as observed above.<sup>[6]</sup>

The study also revealed a great impact of age of subjects on the indications for C/S; preeclampsia and obstructed labor likely from cephalopelvic disproportion were the commonest indication below the age of 24 (Fig. III), while previous scar was the commonest after this age. Preeclampsia is a disease of primigravidae who are likely to be in this age group and previous scars most likely exist in multiparae who are likely to be older; in those women in the group >40 years, antepartum hemorrhage was more common. This is not different from the trend seen in other studies.<sup>[3-9]</sup>

Cesarean section rate and the indication were influenced by booking status of subjects. In this study, 89.4% of the subjects

were booked and this is unexpectedly higher than 69.3% in a referral center in Southeast Nigeria where literacy level is higher and similar poverty level,<sup>[11]</sup> it is also higher than 78.9% reported in Gombe<sup>[8]</sup> the reason for this is that most of the subjects were high-risk pregnancies, having had previous scars or suffered from preeclampsia. About half (52.3%) of the study population were multipara, a finding not too different from the finding by Onwuhafua<sup>[6]</sup> and that by Sheikh<sup>[12]</sup> and Sajjad<sup>[13]</sup> both in Pakistan. The risk of repeat CS is higher in multiparous women who are most likely to have had previous scars and the added risk of malpositions. Moreover, with increasing maternal age they are also prone to medical conditions, pregnancies complicated by multiple fetuses and macrosomia; factors that drive CS intervention currently. Interestingly primigravidae, in a study in the same center by Onwuhafua<sup>[6]</sup> 15 years ago accounted for 18.8% of the cases, which is less than 31.6% in this study although similar to Agwu's 31.5%, 7 years ago,<sup>[11]</sup> exhibiting a clear increase in trend.

In Kano and Gombe, where pregnancy-induced hypertension and cephalopelvic disproportion were the leading indications for CS, it could be a reflection that teenage pregnancy still abounds in these parts of Nigeria,<sup>[7,8]</sup> these two disorders having been associated with teenage pregnancies.

Malpresentation/malposition came in third place after preeclampsia/eclampsia in this study, 87% of this being due to breech presentation. Interventions such as ECV and skilled conduction of assisted breech delivery could have led to a reduction in CS rate from this indication.

Presumed fetal distress is the 4<sup>th</sup> commonest indication, although these were not confirmed cases of distress using fetal scalp PH and we know that use of CTG alone in diagnosing fetal distress increase the CS rate.<sup>[1,2,14]</sup> Obstructed labour (OL) and cephalopelvic disproportion (CPD) rank 5<sup>th</sup> with its attendant risk of fetal and maternal morbidity. Evidence has shown that symphysiotomy and in some cases destructive operative vaginal delivery in carefully selected cases of intrauterine fetal death (IUFD) can help reduce the CS rate from OL and CPD.<sup>[1,5]</sup>

About 13% of the CS were done as electives and this is far lower than Sajjad's<sup>[13]</sup> 48.5% Naidoo's<sup>[10]</sup> 74.6%. In most centers, about one third of total CS are performed electively, our 13% rate is less than one third, since most of our patients were booked, one would have expected a higher elective CS rate, this low elective CS rate could be attributed to low education and wrong dating so that some of those slated for elective CS present as emergencies, also aversion for CS could also make booked women to try vaginal delivery at home and only return to the

hospital when there is a problem, during which they are then done as emergency, resulting in this high emergency CS rate. The MMR during this period was 870/100,000 live births much higher than 587 per 100,000 live births obtained in Gombe,<sup>[8]</sup> and CS-associated mortality was 339/100,000 live births in this study, much higher than 254 per 100,000 CS-related death obtained in Kano.<sup>[7]</sup> PM was 43.9/1000 live births in this study, this is higher than 37 per 1000 live births reported by Onwudiegwu,<sup>[15]</sup> and much higher than 23.5 per 1000 live births reported in Gombe.<sup>[8]</sup> Overall the CS rate, the MMR and PM in these centers were lower when compared to this study. Despite the high CS rate in our study the MMR and PM are still high indicating that a high CS rate does not necessarily lead to an improvement in our health indices,<sup>[14,17]</sup> therefore effort should be geared towards keeping the CS rate within the WHO stipulated range. Interestingly, the leading causes of maternal mortality are also among the leading indications for CS in this study, namely pre-eclampsia/eclampsia, OL, and APH.

However, the study did have a few shortcomings in that it was unable to determine the few number of VBACs, instrumental and vaginal breech delivery that were successfully conducted. There were no cases of ECVs, symphysiotomy or destructive vaginal operations. An audit of all patient records (antenatal and labor, rather than just the patients who had CS) may have provided a more complete picture. There were few industrial actions during the study period.

## Conclusion

The CS rate is unacceptably high and still rising; the trend, indications, and possible remedial measures, which could be adopted to reduce the rapidly rising CS rate, were identified.

We recommend adequate counseling and follow up of our booked women to help them to keep to their appointment, there should be training and retraining in alternative intervention that could help lower the CS rate by all training institutions especially the Postgraduate schools in Nigeria such that alternative interventions to CS can be practiced in carefully selected cases.

## Authors contribution

Abiodun Olusanya: Design and acquisition of data.

Prof. Onwuhafua: Design, planning and critical appraisal.

Dr Samuel Adelaiye: Design, planning, data analysis and writing the manuscript.

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### Conflicts of interest

There are no conflicts of interest.

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