



*Original article*

## Prevalence and Foetal Outcome of Caesarean Section At A Teaching Hospital In Southeast Nigeria

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### ABSTRACT

**Background:** Caesarean section rate has been on the increase worldwide. Uncontrolled increase in the rate of caesarean delivery is known to worsen foetal and maternal outcomes. The objective of this study is to determine the rate of caesarean section (CS) and foetal outcome at birth. **Materials and Methods:** The records of all caesarean deliveries conducted at Abia State University Teaching Hospital (ABSUTH) Aba, Nigeria from 1<sup>st</sup> June 2011 to 31<sup>st</sup> May 2014 were retrospectively analyzed. **Results:** The prevalence rate of CS was 10.9%. Male: female ratio of the fetuses delivered was 1.1:1. Seventy-one (26.1%) of the deliveries were still births. The mothers were aged 20-46 years with a greater majority (31%) aged 25-29 years; most (57%) having secondary education; mostly traders (36.7%) and 68.5% booked. Overwhelming proportion (83.3%) of the caesarean sections were emergency. Seventy-one (26.1%) of the deliveries were still births. Still birth delivery was significantly associated with unbooked status ( $p=0.00$ ), maternal age less than 29 years ( $p=0.02$ ), parity  $> 4$  ( $p=0.031$ ), and emergency caesarean section ( $p=0.00$ ). Apgar scores  $> 7$  at 5 minutes occurred significantly more in babies delivered by elective than by emergency CS ( $p=0.01$ ). Obstructed labour (20%) was the highest indication for CS. Eighty-six (31.9%) of the deliveries were referred to the Special Care Baby Unit with severe birth asphyxia (51.2%) constituting the majority. **Conclusion:** Newborns delivered by elective caesarean section were more viable than those delivered by emergency caesarean sections. Sustained education of the masses especially young women, on the need for booking in pregnancy, would help to curb the incidence of emergency CS and improve foetal outcome.

**KEYWORDS:** ABSUTH, Caesarean section, foetal outcome, Prevalence, Nigeria.

### INTRODUCTION

Parturition which is a physiological process sometimes is fraught with risk to the mother and foetus.[1] High risk pregnancies which are pregnancies associated with factors which can lead to abortion, foetal death, premature delivery, intrauterine growth retardation, neonatal disease or handicaps are a common occurrence and may require caesarean delivery in up to 10% of cases.[2,3] Caesarean section though life-saving carries additional risks to both mother and the newborn.[4]

Risks and complications of caesarean procedure per se to the newborn include premature birth if the gestational age was not calculated accurately, breathing and respiratory problems such as transient tachypnea of the newborn,

hyaline membrane disease if the lungs are not mature, low Apgar scores due to the depressive effect of anaesthesia on the central nervous system and respiratory centre or lack of stimulation of the body which occurs during vaginal delivery and rarely foetal injury from risks and acts during incision on the mother.[5,6]

Caesarean section (CS) rates have been on the increase in recent times in different parts of the world.[7] The rates of caesarean section vary greatly within a country and across nations.[7] In the past 30 years the rate of caesarean section has increased from 5% to over 20% in many countries and even above 30% in some developed countries including United States.[7] In Nigeria for instance, studies carried in a teaching hospital in south east geopolitical zone indicated an increase in incidence of caesarean section from 10.4% in

1989 to 27.6% in 2009.<sup>[8]</sup> Caesarean section rate showed a steady rise in the University of Maiduguri Teaching Hospital, northern Nigeria, over the years: 7.20% in 2000 to 13.95% in 2005.<sup>[9]</sup> Between 2005 and 2010 caesarean delivery rate rose from 29.9% to 35.5% in a Tanzanian referral hospital in east Africa.<sup>[10]</sup>

World Health Organization (WHO) opines that foetal and maternal outcomes in countries are optimal when caesarean section rate lies between 10 and 15%.<sup>[7]</sup> With increasing rates beyond this range maternal and foetal perinatal mortality rates have not improved but actually worsen in some cases.<sup>[7]</sup> Obstetricians globally now adopt measures to drive caesarean section rates towards the WHO defined range.<sup>[7]</sup>

Data of the prevalence rate of caesarean section and foetal outcome in Abia state are rare or non-existent. The non-availability of such data even in this institution justifies the essence of conducting this survey which sought to determine the prevalence rate and foetal outcome at birth of caesarean section as seen at Abia State University Teaching Hospital Aba, Nigeria.

### MATERIALS AND METHODS

The study was a retrospective survey conducted in the Abia State University Teaching Hospital Aba, a tertiary healthcare establishment in south-east Nigeria. The hospital serves as a secondary and tertiary healthcare establishment as well as a referral centre for patients from primary and secondary healthcare institutions, private hospitals and maternities in Abia state, and neighbouring states like Rivers, Akwalbom, and Imo states, all in south-south and south east geopolitical zone of Nigeria.

The Department of Obstetrics and Gynaecology has 10 consultant obstetricians and 13 residents. The average annual delivery is approximately 1,200. The study was conducted from 1<sup>st</sup> June, 2011 to 31<sup>st</sup> May, 2014. The delivery registers of the central delivery unit, unbooked ward and obstetric theatres were perused and the names of mothers who had caesarean delivery and their babies were noted and their case notes retrieved from Medical Records Department and reviewed. Data extracted from the case notes included the type of caesarean section, the maternal age, education, occupation, parity, booking status, gestational age, fetal sex, Apgar scores, indications for caesarean delivery.

The total number of deliveries during the study period was also calculated. Elective caesarean section (CS) was one the decision of which was taken prior to the onset of spontaneous labour. All other CS were considered emergency. Unbooked status describes lack of booking and attendance to antenatal care in the Teaching Hospital. Inclusive criteria were all caesarean deliveries within the Teaching Hospital of singleton pregnancies of 28 weeks or more with adequate information. Exclusive criteria were caesarean deliveries with inadequate information, non-singleton pregnancies as well as those delivered before 28 weeks gestation.

Data was analyzed using EPI-INFO statistical software version 20 and presented in simple percentages and tabular format. Chi square was used as a test of statistics with p values  $\leq 0.05$  considered significant.

### RESULTS

The total number of deliveries over the study period was 2557 of which 278 were by caesarean section giving a prevalence rate of caesarean section of 10.9%. Eight of the caesarean deliveries had inadequate data and were excluded, so 270 were used for further analysis. Majority of the fetuses were males 144 (53.3%) while 126 (46.7%) were females giving a male:female ratio of 1.14: 1.

The age of the mothers ranged from 20 to 46 years with mean age of 31.5 years. Majority, 154 (57%) of the mothers had secondary while 10 (3.7%) had no formal education. Trading, 99 (36.7%); civil servants 54 (20%) and house wife 34 (20%) constituted the leading occupations. Most of the mothers 185 (68.5%) were booked while 85 (30.5%) were unbooked.

The parity of the mothers ranged from 0 to 7 with a mean of 2.4. Table 1 demonstrates other details. Eighty-five (100%) of the unbooked mothers and 150(76.9%) of the booked mothers had emergency CS with significantly more of the unbooked mothers having emergency CS (p=0.039). Seventy-one (26.1%) of the caesarean deliveries were still birth. Significantly more fetuses delivered to the booked mothers were viable at birth than those delivered to the unbooked mothers (p=0.00) Table 2.

**Table 1: Sociodemographic data of women who had caesarean delivery (N=270)**

Sociodemographic Characteristics	Number	Percentage
AGE		
20-24	27	10.0
25-29	85	31.5
30-34	63	23.3
>/35	95	35.2
EDUCATION		
None	10	3.7
Primary	25	9.3
Secondary	154	57.0
Post secondary	81	30.0

OCCUPATION		
Trading	99	36.7
Student	22	8.1
Civil servant	54	20.0
House wife	54	20.0
Seamstress	23	8.5
Hairstylist	18	6.7
BOOKING STATUS		
Booked	185	68.5
Unbooked	85	31.5
PARITY		
0	72	26.7
1-4	189	70.0
>4	9	3.3
FETAL SEX		
Male	138	51.1
Female	122	45.2
Unidentified	10	3.7

**Table 2: Relationship between fetal viability at birth and antenatal characteristics of mothers**

Variable	Frequency of mothers	Number of fetuses viable at birth	Percentage	Number of fetuses dead at birth	Percentage	P Value
Booking status						
Booked	189	181	95.8	8	5.2	P<0.00
Unbooked	81	18	22.2	63	77.8	
Maternal age						
20-24	27	13	48.1	14	51.9	P <0.05
25-29	77	50	64.9	27	35.1	
30-34	63	54	85.7	9	14.3	
>/35	95	84	88.4	11	11.6	
Parity						
0	70	55	78.6	15	21.4	p=0.031
1-4	190	140	73.7	50	26.3	
>4	10	4	40.0	6	60.0	

**Table 3: Relationship of maternal age to booking**

Age (Years)	Number of mothers	Booked	Percentage	Unbooked	Percentage	P Value
20-24	27	11	40.7	16	59.3	
25-29	85	70	87.3	15	17.7	0.002
30-34	63	54	85.7	9	14.3	
>'35	95	72	75.8	23	24.2	

Similarly, significantly more fetuses delivered by caesarean section were viable in mothers aged 25 years and above than those aged less than 25 years ( $p=0.02$ ) Table 2. Significantly more newborns delivered to mothers of parity 0 to 4 were viable than those delivered to mothers of parity more than 4. ( $p=0.031$ ). Table 2.

Majority, (59.3%) of the mothers aged 20 to 24 years were not booked (Table 3). Study observation shows that significantly more newborns delivered by elective caesarean section were viable than those delivered by emergency caesarean section ( $p= 0.00$ )Table 4.

We also observed that significantly more (100%) newborns delivered by elective caesarean section had Apgar scores more than 7 at 5 minutes than those (56%) delivered by emergency caesarean section ( $p= 0.01$ ),Table 4. The greatest number of foetal deaths at birth (42.6%) was due to obstructed labour (Table 5). Our results show that the major indications for caesarean section were obstructed labour (20%), previous caesarean section (19%), fetal distress (15%). Referrals to Special Care Baby Unit were as follows: birth asphyxia 44(51.2%); risk for sepsis 25(29.1%); prematurity 17(19.7%).

**Table 4: Relationship between type of caesarean section, fetal viability at birth, and Apgar score at 5 minutes post-delivery**

Type of CS	Number of mothers	Number of fetus viable at birth	Number of fetus dead at birth	Number of fetuses with Apgar score <7	Number of fetuses with Apgar score >7	P Value
Elective	45	45 (100.0)	0 (0.0)	0 (0.0)	45 (100.0)	
Emergency	225	166 (73.8)	59 (26.2)	99 (44.0)	126 (56.0)	P=0.00

CS = Caesarean Section

**Table 5: Indications for Caesarean Section among the mothers and associated fetal deaths at birth**

Indication	Number Of mothers	Percentage	Number of Foetal deaths	Percentage of Foetal deaths
Obstructed labour	54	20.0	23	8.5
Previous CS	49	18.2	1	0.4
Fetal distress	41	15.2	1	0.4
Placenta praevia	32	12.0	9	3.3
Poor progress In labour	27	10.0	4	1.5
Breech presentation	27	10.0	0	0.0
Prolonged rupture of membrane	14	5.2	4	1.5
Eclampsia	9	3.0	8	3.0
Failed induction	8	3.0	0	0.0
Severe PET	8	3.0	1	0.4
Hand prolapse	1	0.4	0	0.0
Total	270	100.0	51	18.8

## DISCUSSION

Caesarean section (CS) is noted to be the commonest obstetric operative procedure worldwide.[11] When applied appropriately it improves maternal and fetal outcomes.[7] However, when the prevalence of CS falls outside the World Health Organization (WHO) recommended range it could actually worsen maternal and fetal morbidity and mortality.[7] WHO recommends the CS rate of 10-15%.[7]

The objective of this study is to determine the prevalence of caesarean section and the foetal outcome at birth at the Abia State University Teaching Hospital. In our study, caesarean section rate obtained was 10.9%. This prevalence was in keeping with WHO recommendation of Caesarean section rates of 10-15%.[7] The finding was also similar to 10.4% reported from Awka,[11] south east Nigeria and 11.3% documented at Sokoto,[12] north west Nigeria but much lower than 27.6% obtained in Enugu, south east Nigeria,[8] and 23.1% reported in Ogun State,[13] south west Nigeria and most developed countries of the world like United States 32.2 %,[14] Canada 26.9%,[15] and Australia 32.3%.[16]

Our study revealed that significantly more fetuses delivered to the booked mothers were viable at birth than those delivered to the unbooked mothers. ( $p < 0.05$ ). Similar observation has been universally documented previously by various authors.[11-13] This situation could be attributed to the fact that outright lack of antenatal care, patronage of unorthodox places including untrained traditional birth attendants, unskilled health care attendants, spiritual houses and places of worship by pregnant women for purposes of antenatal supervision and delivery as well as home delivery

are still rife in developing countries with patients presenting to the teaching hospital often late when labour becomes deeply complicated and the foetus irredeemably endangered resulting in stillbirth.

Result of our study indicated that significantly more newborns delivered by CS were viable at birth in mothers aged 25 years and above than younger mothers. This observation is at variance with several previous reports which expressed that advancing maternal age particularly above 35 years is a significant risk factor for still birth.[17,18] However, our finding could be explained by the fact that closer study of our parturients revealed that significantly more mothers in the age group 25 years and above were booked than those less than 25 years (Table 3). Possibly, these older mothers are generally more experienced and appreciative of the necessity for appropriate antenatal supervision with its health benefits including greater tendency to viability of mother and the newborn after delivery than the younger ones.

Significantly more newborns of mothers of parity 1-4 delivered by CS were viable at birth than those of mothers of parity more than 4 (Table 2). Grand multi parity has been consistently previously acknowledged as risk factor for still birth. Suleiman et al reported from Katsina in 2015 that antenatal characteristics of parturient including advanced age above 35 years and grand multi parity were significant risk factors for stillbirth in a hospital based study.[19]

Various other previous reports implicated grand multi parity as associated with still birth.[17,18,20] Grand multi parity is generally associated with increasing age and chronic medical conditions more common with advanced age may

complicate the pregnancy of affected subjects resulting in increased risk of still birth. Lawan et al also reported that grand multi parity can significantly be complicated with gestational diabetes, and this may explain the increased rate of still birth in grand multiparous parturients. [20]

Our study also revealed that foetal viability at birth was significantly more in the babies delivered by elective CS than in those delivered by emergency CS. Fetal mortality occurring more with emergency than elective CS has been reported severally by previous authors.[8,11,21] Emergency CS often arises when pregnancy or labour becomes complicated and there is often delayed presentation to appropriate health facility and occasionally poor preparedness (including unreliable power supply) even in the health facility in developing countries resulting sometimes in ineffective intervention with poor Apgar score at birth or even death.

Emergency caesarean section also often is done on subjects who are not booked, with little or no antenatal supervision and therefore failure to detect and manage promptly possible pregnancy complications that could result in still birth.

Significantly more newborns having normal Apgar scores at birth being delivered at elective CS than at emergency CS was observed in our study. Similar observation has been reported severally previously.[21,22] Emergency CS is resorted to usually when there exists complication of pregnancy or labour capable of compromising foetal or maternal survival, the prolongation of which often results in poor Apgar scores or even stillbirth at delivery. Circumstances associated with emergency CS including lack of booking, initial management of labour by unqualified persons, delay in getting appropriate management all constitute delays in ensuring prompt application of CS when indicated often resulting in in-utero foetal exhaustion and low Apgar scores at birth in contrast with elective CS where the delivery is planned and there is usually no pre-delivery cardiopulmonary compromise to the mother or foetus thereby resulting usually in good Apgar scores.

The major indications for CS noted in this study were obstructed labour (20%), previous caesarean section (19%), and fetal distress (15%). Similar observations have been reported severally from previous studies.[8,21,22] In circumstances where lack of booking and patronage of unorthodox places for the purpose of supervision of pregnancy and labour with delays prior to referral and arrival of complicated cases at appropriate health facility are rife, conditions in pregnancy and labour likely to result in obstructed labour or foetal distress which could have been detected early and managed or referred promptly are undetected or ignored leading unavoidably to those complications.

Our study revealed that the worst still birth rates were associated with eclampsia, obstructed labour and prolonged rupture of membranes. Previous reports were in tandem with this observation.[22-24]Eclampsia which often results from pre-eclampsia may result in still birth due to accentuated in utero placental insufficiency during seizures with further compromise of nutrient and oxygen supply to the foetus. Obstructed labour usually leads to foetal distress and if it is not duly relieved can result in fetal demise in utero. Prolonged rupture of membranes has been reported

previously as possibly resulting in intra-uterine fetal infection and disease. [25]

Birth asphyxia (51.2%) topped referrals to the special care baby unit of the hospital as revealed by our study. Similar observation has been universally reported previously.[8,21,22] In a situation where obstructed labour and foetal distress rank among the highest indications for caesarean section and obstetric foetal monitors are not readily available as in our study, foetal exhaustion prior to delivery is bound to be common resulting in poor respiratory effort and other features of birth asphyxia.

## CONCLUSION

The prevalence of C/S in ABSUTH is still within the WHO recommended range. Newborns delivered by elective caesarean section were more viable than those delivered by emergency caesarean sections. Unbooked status and higher maternal parity were associated with worst fetal outcomes after C/S. Sustained education of the masses especially young women, on the need for booking in pregnancy, would help to curb the incidence of emergency CS and improve fetal outcome.

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