

Determinants and outcomes of elective and emergency caesarean section at a tertiary hospital in Abakaliki, Southeast Nigeria: A 6-year review

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ABSTRACT

Background: Despite its increasing acceptance as a safe alternative to vaginal delivery, caesarean section (CS) in developing countries continue to be associated with maternal and fetal morbidity and mortality.

Objectives: This study was aimed at evaluating the indications, outcomes and factors associated with increased CS at the Federal Teaching Hospital, Abakaliki.

Methods: This was a six year retrospective study covering 2012 to 2017. Case notes of patients were identified and retrieved from the records unit of the hospital. Information extracted include sociodemographic variables, indications and types of CS performed and the complications. These data were entered into a personal computer and analysed with Epi Info version 7.

Results: These were presented using tables and percentages. A p-value of 0.05 was considered significant. In 6 years, 11,215 women were delivered, 2405 (21.4%) had emergency CS while 1445 (12.9%) had elective CS; giving a CS rate of 34.3%. The most common indication for emergency CS was cephalopelvic disproportion (22.0%) while previous caesarean section (27.7%) formed the major indication for elective CS. Severe birth asphyxia was recorded in 17.2% and 4.2% of babies delivered by emergency and elective CS respectively. Booking status, parity and patient's age had statistically significant association with the chance of having a CS. Maternal and perinatal deaths were recorded in 2.6% and 5.0% for emergency CS compared to 1.0% and 0.2% for elective CS. Although lifesaving, CS, due to an existing condition or complication in the patient, may be associated with an increase in maternal and fetal morbidities and mortalities.

Conclusion: There was a higher burden of complication with emergency CS due to its associated determinants. Adequate training of healthcare personnel on ways of minimizing complications against the backdrop of an existing problem and an efficient referral system will help reduce these morbidities and mortalities.

Key words: Abakaliki; caesarean section; determinants; Nigeria; outcomes.

Introduction


Pregnancy and childbirth are indispensable for the perpetuation of the human race. Pregnant women may be delivered through a vaginal birth or by the abdominal route, so-called caesarean section (CS).^[1] CS is the delivery of the fetus and products of conception through an incision made on the abdomen and

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the uterus after the age of viability, considered 28 weeks in our environment.^[2] The need for a CS in any pregnancy can be due to factors related to the pregnant woman, her fetus, or a combination of both. It is one of the oldest procedures in obstetric practice and may be a justifiable reason to terminate a pregnancy when there is danger to the parturient woman or her fetus, especially when vaginal delivery is not appropriate.^[3,4]

Sub-saharan Africa and Nigeria in particular have the highest burden of maternal and perinatal morbidity and mortality; a significant proportion of causal factors can be eliminated with a timely CS.^[5] Despite the immense contribution of CS to improved and safe obstetric care, there continues to be a strong aversion to it especially in developing countries, more often than not for fallacious reasons.^[2,6] There is also the public health problem of increasing CS rate worldwide, far above the World Health Organization recommendation of 10%–15%, in some cases for unjustifiable indication including monetary incentive.^[7,8]

Ours is a developing country and multiple factors impede access to quality healthcare services during pregnancy and delivery. Poverty, cultural barriers, illiteracy, gender inequality and/or male dominance, and ignorance are direct and indirect causes of significant delays in healthcare utilization, while increased age, education, and high socioeconomic status are positively associated with improved health and quality of life.^[9] A majority of the CSs performed in Nigeria are due to obstetric emergencies that could have been averted by adequate antenatal care and good health-seeking behavior.^[8,10]

To attain the sustainable development goals of reducing the maternal mortality worldwide, the importance of timely access to life-saving obstetric interventions such as CS cannot be overemphasized.^[10] Although fetal and maternal well-being in pregnancy depends on the quality of care received from the preconception period, a large chunk of it depends on the quality and timeliness of the intrapartum care.^[11] CS offered as an emergency or elective procedure is associated with increased maternal and fetal morbidity and mortality compared with an uncomplicated vaginal delivery.^[12] An evaluation of factors that correlate with having a CS might provide insight on ways to avert needless CS while rationalizing the need to perform one when it is needed.

Aims and Objectives

The following are the objectives of this study:

To evaluate the CS rate

To evaluate the factors that determine why a CS would be performed

To evaluate the associated sequela of emergency and elective CS

Methodology

This was a retrospective study conducted at the Federal Teaching Hospital, Abakaliki (FETHA), from January 2012 to December 2017. FETHA was created on 23 December 2011 following the acquisition and merger of the defunct Ebonyi State University Teaching Hospital with the Federal Medical Center Abakaliki by the Federal Government. It is a referral hospital serving the neighboring states of Enugu, Abia, Anambra, Cross-River, and Imo states.

Following ethical clearance from the hospital ethical committee, case notes of patients who had CS were retrieved from the health information management unit. Sociodemographic variables, type, indications for CS, and birth outcome data were extracted. Patients who had antenatal care in our facility were considered “booked,” while those who did not receive antenatal care but presented on referral following complications in pregnancy or labor were considered “unbooked.” Abdominal deliveries at a gestational age of less than 28 weeks and case notes with incomplete records were excluded. Data cleansing was done and subjected to analysis using Epi Info version 7. All information obtained were kept anonymous and confidential. Findings are presented as frequencies and percentages. Chi-square test was used to examine the association between variables. A *P* value of <0.5 was considered significant.

Results

During the period under review, a total of 3850 women had CS, while 11,215 deliveries were recorded at FETHA, giving an

Table 1: Sociodemographic characteristics of participant

Variables	Subunits	EMCS (%)	ELCS (%)
Age (years)	<20	70 (2.9)	15 (1)
	20-29	1300 (54.1)	615 (42.6)
	30-39	1005 (41.8)	770 (53.3)
	40-49	30 (1.2)	45 (3.1)
Address	Urban	1535 (63.8)	1000 (69.2)
	Suburban	445 (18.5)	235 (16.3)
	Rural	425 (17.7)	210 (14.5)
Booking status	Booked	1610 (66.9)	1200 (83.0)
	Unbooked	795 (33.1)	245 (17.0)
Parity	Nullipara	1105 (45.9)	520 (36.0)
	Primipara	700 (29.1)	685 (47.4)
	Multipara	235 (9.8)	120 (8.3)
	Grandmultipara	365 (15.2)	120 (8.3)
Total		2405	1445

EMCS: emergency caesarean section; ELCS: elective caesarean section

overall CS rate of 34.3%. Of this, 2405 (62.5%) had emergency CS, while 1445 (37.5%) had elective CS.

Table 1 shows the sociodemographic characteristics of the patients. Women age 20–29 years had the highest rate of emergency CS (54.1%), while those age 30–39 years had the highest rate of elective CS (53.3%). In both groups, urban women had the highest CS rates at 63.8% and 69.2%, respectively, for emergency and elective CSs. Of the 2405 women who had emergency CS, 66.9% of them were booked. In terms of parity, there were more nulliparous women having emergency CS (45.9%) as against primiparous women who made up the highest population in elective CS group (47.4%).

Tables 2 and 3 show the indications for CSs. The most common indications for emergency CS were cephalopelvic disproportion (22.0%), fetal distress (12.8%), and obstructed labor (11.6%), while previous CS (27.7%), persistent breech presentation at term (20.1%), and cephalopelvic disproportion (10.0%) formed the major indications for elective CSs. The least indications were retained second twin (1.0%) and postdate pregnancy (1.0%) for emergency CSs, while higher order multiple pregnancy (0.35%) and previous successful vesicovaginal fistula repair (0.35%) formed the least indications for elective CSs.

Tables 4 and 5 on pregnancy outcome show that majority of the women had CS at term. About 75.1% and 80.3% of patients at term, respectively, had emergency and elective CSs. Almost equal number of babies delivered by emergency and elective CSs had normal birth weights, but 11.4% and 6.0% of macrosomic babies had elective and emergency CS, respectively. Severe birth asphyxia was recorded in 17.2% of babies delivered by emergency CS, while 4.2% of babies delivered by elective CS suffered birth asphyxia. More babies in the elective CS group had normal APGAR scores at 5 min.

Sociodemographic characteristics of the patient had some association with mode of CS. With a *P* value of <0.05, booking status, parity, and patient's age had statistically significant association with the chance of having a CS, while the place of residence does not have an association.

Table 6 shows the fetomaternal complications. Anemia (52.6% vs 13.7%) and infectious morbidities (13.4% vs 7.0%) formed the highest complication recorded among the emergency CS and elective CS groups. Maternal deaths (2.6% vs 1.0%) and perinatal deaths (5.0% vs 0.2%) were recorded for emergency and elective CSs, respectively.

Table 2: Indications for emergency cesarean section

Indication	Frequency	Percentage
Cephalopelvic disproportion	530	22.0
Fetal distress	307	12.8
Obstructed labor	280	11.6
Hypertensive disorders of pregnancy	265	11.0
Previous caesarean section	250	10.4
Antepartum hemorrhage	225	9.4
Malpresentation/malposition	125	5.2
Failed induction	115	4.8
Preterm labor	100	4.2
Severe oligohydramnios/Intra uterine growth restriction (IUGR)	65	2.7
Cord prolapse/cord presentation	65	2.7
Prolonged labor	30	1.2
Retained second twin	25	1.0
Postdate pregnancy	23	1.0
Total	2405	100

Table 3: Indications for elective cesarean section

Indication	Frequency	Percentage
Previous caesarean section	400	27.7
Persistent breech presentation	290	20.1
Suspected cephalopelvic disproportion	145	10.0
Twin pregnancy	140	9.7
Antepartum hemorrhage	130	9.0
Suspected fetal macrosomia	95	6.6
Malpresentation/malposition	65	4.5
Elderly primigravida	50	3.4
Bad obstetric history	45	3.1
Maternal request	30	2.1
Artificial reproductive technology (ART) conception	25	1.7
Triplet pregnancy	20	1.4
Higher order multiples	5	0.35
Previous successful vesico-vaginal fistula (VVF) repair	5	0.35
Total	1445	100

Table 4: Comparison of birth weight and APGAR scores

Variables	Subunits	EMCS	ELCS
Gestational age (weeks)	<37	484 (20.1)	245 (17.0)
	37-41+6	1807 (75.1)	1160 (80.3)
	≥42	114 (4.8)	40 (2.8)
Birth weight (kg)	<2.5	505 (21.0)	210 (14.5)
	2.5-3.9	1755 (73.0)	1070 (74.0)
	4 and more	145 (6.0)	165 (11.4)
APGAR score (5 th min)	0-3	413 (17.2)	60 (4.2)
	4-6	515 (21.4)	115 (7.9)
	7-10	1477 (61.4)	1270 (87.9)
Total		2405	1445

EMCS: emergency caesarean section; ELCS: elective caesarean section

Discussion

Despite the rising rate, CS remains a safe obstetric surgical procedure that potentially contributes to reducing

fetomaternal morbidity and mortality when delivered timely and for the right indication.^[13] Nonetheless, its benefits do not justify its continuous increase because of the associated higher complication rate when compared with vaginal deliveries.^[14] Although significant progress has been made in making this procedure as safe as possible through improved anaesthesia, development of potent antibiotics, safe, and efficient blood banking services, it is fraught with adverse maternal and fetal outcomes especially in developing countries; this may be in part related to problems inherent in these climes. These include poverty, poor nutrition, poor growth, and poor pelvic development among others. CS can be done as an emergency or an elective procedure; comparative studies have shown contrasting outcomes for the mother and child depending on what manner of CS was done.^[14-16]

The overall CS rate from this study was 34.3%. There was a significant increase from 16.4% reported by Onoh *et al.* in Abakaliki.^[17] Of this value, the emergency CS rate was 62.5%, while the elective CS rate was 37.5%. The ratio of emergency to elective CS reported in this study is similar to the findings reported from other studies with emergency CS forming the bulk of CSs done,^[13-18] but it is in contrast to the 69.8% rate for elective CS and 30.2% rate for emergency CS reported by Sichundu *et al.* in Zambia.^[19] This disparity might be explained by the fact that our center is a reference hospital receiving referrals from peripheral hospitals and traditional birth attendants. Even though more booked women had emergency CS than unbooked women (66.9% vs 33.1%), this was similar to what Onoh *et al.* reported here in Abakaliki in 2011 (59.7% vs 40.3%).^[17] The reason for this is not readily discernible from this study, but could be partly because FETHA is located in the heart of Abakaliki and the urban dwellers (who form the majority of the booked women in FETHA) have higher socioeconomic status and education which could imply that they are more likely to accept a CS compared with the rural women.^[18,19,20] The urban dwellers are also more likely to have attended the antenatal clinics more regularly, listened to health talks, and know more about birth preparedness and complication readiness and CSs. All these weigh in favor of willingness to give consent when the need arises.

The most common indications for emergency CS were cephalopelvic disproportion (22.0%), fetal distress (12.8%), and obstructed labor (11.6), while previous CS (27.7%), persistent breech presentation at term (20.1%), and cephalopelvic disproportion (10.0%) formed the major indications for elective CSs. The least indications were retained second twin (1.0%) and previous successful vesicovaginal fistula repair (0.35%) for emergency and elective CSs, respectively.

Table 5: Relationship between sociodemographic characteristics and likelihood of having either EMCS or ELCS

Sociodemographic characteristics	Subunits	Chi-square	DF	P
Address	Urban	4.769	2	0.092
	Semi-urban			
	Rural			
Age (years)	<20	32.741	4	0.000*
	20-29			
	30-39			
	40-49			
	50 and above			
Parity	Primipara	56.472	3	0.000*
	Multipara			
	Grand multipara			
	Nullipara			
Booking status	Booked	47.476	1	0.000*
	Unbooked			

*Statistically significant, i.e., $P < 0.05$

Table 6: Fetomaternal complications

Complication	EMCS (%)	ELCS (%)
Anemia	1265 (52.6)	198 (13.7)
Infectious morbidity	323 (13.4)	101 (7.0)
Primary postpartum hemorrhage	175 (7.3)	50 (3.4)
Maternal death	62 (2.6)	15 (1.0)
Birth asphyxia	413 (17.2)	60 (4.3)
Perinatal death	120 (5.0)	3 (0.2)

EMCS: emergency caesarean section; ELCS: elective caesarean section

The preponderance of cephalopelvic disproportion and fetal distress could be an overdiagnosis considering that such diagnosis may have been made by doctors in training (residents) with little or no facility for confirmatory diagnosis other than a cardiotocograph in the case of fetal distress.^[14,18,19] Our findings are comparable to reports from similar institutions in Nigeria.^[9,10,21]

We found that maternal sociodemographic characteristics of age, parity, and booking status were significantly associated with having a CS ($P < 0.05$). The relationship between places of residence was not statistically significant. This is similar to other studies which showed that increased maternal age was associated with increased CS rate.^[22,23] Also, our findings also showed statistically significant association between CS and low parity (nullipara and primipara). This might be due to the high incidence of cephalopelvic disproportion earlier reported. Other studies also showed similar associations,^[24,25] but in contrast to our findings, Maktha *et al.* didn't find significant association between age and parity with CS.^[12] The reason for this was not clear.

In our study, CS was associated with maternal and fetal morbidity and mortality, but there were more complications

recorded for women who had emergency CS. Postpartum anemia was the most common maternal complication in both groups with 52.6% of women who had emergency CS presenting with postpartum anemia as against 13.7% recorded for women who had elective CS. This might be related to the fairly high number of emergency CSs performed by trainee (resident) doctors in our center. Proper supervision and attention to adequate hemostasis should be emphasized. Also, the high rate of postpartum hemorrhage recorded might be ascribed to the high incidence of cephalopelvic disproportion which in some cases was associated with postpartum uterine atony, and subsequent primary postpartum hemorrhage. This may have led to postpartum anemia, as recorded in our study population. Maternal mortality was also higher among women who had emergency CS, but overall 3.6% of women who had CS died and this is less than 6.1% reported from this institution by Onoh *et al.*^[17] But similar to their findings, obstetric hemorrhage and severe anemia were the most cause of maternal deaths. The victims were unbooked referred patients who came in very bad states. In this study, severe birth asphyxia at 5 min was found in 17.2% of newborns whose mothers had emergency CS compared with 4.3% of those whose mothers had elective CS. This might be due to the relatively high number of unbooked patients who more often than not have had prolonged complicated labor and compromised fetuses before presenting to the hospital. This could also account for the higher perinatal mortality recorded in the emergency CS group, usually a fall-out of the severe birth asphyxia already alluded to. These high complication rates recorded could be reduced by eliminating factor(s) that lead to the three delay model ranging from delay in seeking help to delay in accessing care. Proper patient selection and attention to intrapartum fetomaternal surveillance will also lead to reduction in complication profiles.

Although our study showed an increased fetomaternal morbidity and mortality associated with CS, but this is less than what was reported in an earlier study in the same institution, this does not justify the more than two-fold increase in the rate of CS over a 6-year period. The predominance of emergency caesarean not only in rate but also in fetomaternal complications might be a pointer to inadequate antenatal care and poor referral services. To reduce the rate and risks of CS, deliberate efforts should be made to raise public awareness on good health-seeking behavior, equip the hospitals, employ, and train appropriate manpower to meet the growing population of antenatal women. Modifiable risk factors for CS such as early marriage with its attendant inadequate pelvic development and

needless aversion for hospital delivery due to fear of CS should be discouraged while ensuring that any indication for a CS is reasonably valid.

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Conflicts of interest

There are no conflicts of interest.

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