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#### CAESAREAN DELIVERY IN URBAN SECOND TIER MISSIONARY HOSPITAL IN NIGERIA

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E. M. IKEANYI and A. O. ADDAH

#### ABSTRACT

**Objective:** To determine the current trend of Caesarean and highlight the role of a major operative obstetric practice in materno-foetal medicine.

**Design:** Descriptive case study.

**Setting:** St Philomena Catholic Hospital (SPCH), an urban second tier missionary hospital.

**Subjects:** One thousand and fourteen (1014) Caesarean deliveries that took place at the centre between January 2009 and December 2013.

**Main outcome measures:** These were Caesarean section rates, the trend, indications and materno-foetal complications.

**Results:** The rate of Caesarean birth in this study was 1014(21.0%), EMCS constituted 816(80.5%) and elective CS 198(19.5%). The leading indications for EMCS were cephalopelvic disproportion(CPD)323 (39.6%) and obstructed labor 135(16.5) while previous caesarean section 102(51.5%) and breech presentation 41(20.6%) were the leading indications for elective CS. The major maternal complications were postpartum haemorrhage 7.2% and post-partum anaemia 47.7% for EMCS and the values for ELCS were 6.6% and 36.9% respectively. The perinatal complications were Apgar score <7 at 5 minute 5.1% vs. 1.5% Odd ratio (OR) 3.5, P-value (P) 0.021 and SCBU admission 7.1% vs. 2.6% OR 2.9, P 0.014 respectively for EMCS and ELCS. The composite perinatal complications were 15.2% vs. 7.6%, OR 2.2, P 0.0039.

**Conclusion:** To the obstetric world, we proffer quality prenatal care, quality labour supervision and strict case selection based on medical and obstetric merits for Caesarean births.

#### INTRODUCTION

Caesarean section remains a key option for the reduction of adverse maternal and perinatal outcomes. The art has greatly evolved overtime from when it was associated with frightening morbidity and mortality close to its inception in 1610 when the first procedure took place to an era of seldom adverse outcome. Efficient blood transfusion services, increasing anesthetic safety, neonatal services and growing skills in surgery have immensely contributed to this.

The rate of Caesarean birth varies widely from developed to developing countries. In general the rate increases global affecting all races, ages, geographical settings and gestational ages (1) A global rate of 15-21% has been reported while in North America 21.2-36.5% (1-4) with the main reasons for the high CS rate being the increasing primary CS rate contributed by increasing CS without medical or obstetric indications

and steep decline in VBACS (28.3% to 9.2%). The trends are not different in Europe, Asia, sub-Saharan Africa and Nigerian (5-10). There is a corresponding increase in morbidity with successive Caesarean section (11-12). There was poor acceptability of Caesarean section among women in sub-Saharan Africa for various reasons. While poor educational attainment, previous successful vaginal and instrumental vaginal births impair the acceptability (13), previous Caesarean or major surgical experience positively influence the acceptability (14) of Caesarean delivery in Nigeria.

Caesarean birth is viewed differently by different people. While the health professionals consider it an expeditious route for mother and baby in difficult labor and emergency situations, average obstetric woman in developing countries sub-Saharan Africa with high premium to vaginal delivery, considers it a reproductive failure. The trend globally rises for divergent reasons ranging from medico-legal

to anxiety for quality obstetric outcome. These researchers were inspired to appraise the caesarean delivery to highlight its contribution to materno-foetal outcome and subsequently add to the increasing wealth of data. It is hoped to provide data for other researchers, policy makers and health planning.

## MATERIALS AND METHODS

This case series took place at St Philomena Catholic Missionary Hospital (SPCH). SPCH is second tier urban missionary hospital. It is one of the oldest serving health facilities in Edo state with over 70 years of healthcare delivery. This 120 bedded hospital was majorly popular for its obstetric care services. It is strategically located at centre of Benin City, Edo state capital in the South South geopolitical region, Nigeria. The obstetric department of the hospital is manned by an obstetrician/gynaecologist and ten medical officers who were rotated through the various units. The facility was a long standing midwifery training institution. It sub serves other private health facilities within and around the city.

From January 2009 to December 2013 the case files of all the Caesarean deliveries that took place at the center were retrospectively reviewed. All the case files of complicated CS done elsewhere before referral to the study center were excluded from the study. The case files were retrieved with the assistance of the medical records staff. Data base was raised on the sociodemographic characteristics, mode of delivery, type of CS, indications for the caesarean

births, maternal and perinatal outcome. The record of the vaginal deliveries within the reviewed period was also noted for the estimation of the Caesarean section rates.

Caesarean section was defined as surgical procedure involving anterior abdominal and uterine incisions made to deliver a viable fetus. EMCS was unplanned while ELCS was planned CS. Prolonged hospital stay was a post-operative period exceeding seven days irrespective of the cause other than voluntary reasons.

The study was approved by the hospital local ethical committee. There was no involvement of patient identifiers in the data collection process therefore consent from the patients was not required. Computer statistical analysis was done with EPI-INFO version 5.3.1 statistical software developed by the center for disease control and prevention (CDC) in Atlanta Georgia USA and released in August 2008.

Statistical test was done using Chi square or Fisher's exact test where appropriate. The means were compared using Student's t-test as appropriate. Statistical significance was set at 95% confidence interval (p-value<0.05).

## RESULTS

A total of 1014 Caesarean deliveries took place among 4822 deliveries that were managed at the centre during the reviewed period, a caesarean section rate of 21.0% (Table 1). Emergency

**Table 1**  
*Distribution of Caesarean delivery by Year of Delivery*

Year	Vaginal deliveries	EMCS	ELCS	Total CS (%)	Total Deliveries
2009	769(78.2)	178(18.0)	37(3.8)	215(21.8)	984
2010	836(77.6)	224(20.5)	32(2.9)	256(23.4)	1092
2011	850(82.1)	145(14.0)	40(3.9)	185(17.9)	1035
2012	691(80.5)	126(14.7)	41(4.8)	167(19.5)	858
2013	662(77.6)	143(16.8)	48(5.6)	191(22.4)	853
Total	3808(79.0)	816(16.9)	198(4.1)	1014(21.0)	4822

Caesarean section constituted 816 (80.5%) and elective Caesarean birth 198 (19.5%) of all the Caesarean deliveries. Over the study period there was no significant change in the trend in overall Caesarean delivery rate 21.8% in 2009 to 22.4 % in 2013 ( $X^2=0.6962$ ,  $P=0.40$ ). However there appeared to be significant rise in the elective Caesarean delivery rate from 3.8% in 2009 to 5.6% in 2013 ( $X^2=6.212$ ,  $P=0.013$ ) and a significant decline in EMCS rate over the same period from 18.0% to 16.8% ( $X^2=4.386$ ,  $P=0.036$ ). Table 2 showed that the mean age of the women who had Caesarean birth was  $29.2\pm 4.4$  years and  $31.9\pm 4.6$  respectively for EMCS and ELCS ( $t=6.79$ ,  $P<0.0001$ ). The women who had ELCS were

**Table 2**  
*Socio-demographic Characteristics of mothers by type of Caesarean Birth*

Characteristic	Variables	EMCS n (%)	ELCS n (%)	Total	OR(95% CI)
Age(years)	</=19	3(0.4)	-	3(0.3)	
	20-24	109(13.4)	11(5.6)	120(11.8)	2.62(1.38-4.98),p=0.0014
	25-29	350(42.9)	55(27.7)	405(39.9)	1.95(1.39-2.75),<0.0001
	30-34	254(31.1)	72(36.4)	326(32.1)	0.79(0.57-1.10),p=0.173
	=/>35	100(12.2)	60(30.3)	160(15.8)	0.32(0.22-0.46),p<0.0001
	Mean age	29.2±4.4	31.9±4.6		T=6.79,p<0.0001
Parity	0	489(59.9)	45(22.7)	534(52.7)	5.12(3.4-7.7), p<0.0001
	1-4	310(38.0)	143(72.2)	453(44.7)	0.24(0.16-35),p<0.0001
	=/>5	17(2.1)	10(5.1)	27(2.6)	0.38(0.16-0.94),p=0.046
Education attainment	Nil	1(0.1)	3(1.5)	4(0.4)	
	10	40(4.9)	17(8.6)	57(5.6)	0.55(0.30-0.99),p=0.057
	20	298(36.5)	52(26.3)	350(34.5)	1.62(1.14-2.27),p=0.0075
	30	477(58.5)	126(63.6)	603(59.5)	0.80(0.58-1.11),p=0.197
Booking status	Booked	722(88.5)	188(94.9)	910(89.7)	0.42(0.2-0.89), p=0.02
	Unbooked	94(11.5)	10(5.1)	104(10.3)	2.38(1.12-5.06),p=0.02

2.7 years significantly older than those who had EMCS. About 42.9% majority of the women who had EMCS aged 25-29 years while 36.4% majority of those who had ELCS aged 30-34 years. Majority (59.9%) of the women who had emergency Caesarean delivery were nullipara while 72.2% majority who had planned CS was parous women. They were mostly of tertiary level of education (59.5%) and about 9 out of every 10 of the women had antenatal care at the centre. The leading indications for EMCS were cephalopelvic disproportion (39.6%) and obstructed labour (16.5%) and repeat CS (51.5%) followed by breech presentation 20.6% were the main indications for ELCS (Table 3).

**Table 3**  
*Indications of Caesarean Delivery*

Indication	EMCS n (%)	ELCS n (%)	Total%
Obstructed labour	135(16.5)	-	135(13.3)
Failed Induction	41(5.0)	-	41
Foetal distress	81(9.9)	-	81
Gestational Hypertension	65(8.0)	5(2.6)	70
APH	64(7.9)	-	64
Cephalopelvic disproportion	323(39.6)	-	323(31.9)
Previous CS (≥1 )	-	102(51.5)	62
Placenta praevia	-	9(4.5)	9
Short interpreg. interval	4(0.5)	10(5.2)	14
Cord prolapsed/presentation	12(1.4)	-	12
Obligue/transverse lie	28(3.5)	15(7.7)	43
Lower segment/cervical fibroid	-	5(2.6)	5
PROM in HIV Positive	4(0.5)	-	4
Breech presentation	50(6.1)	41(20.6)	91
Others- BOH, congenital anomaly,short stature	-	6(3.2)	6
Multiple preg.+ DM or and CHTN	9(1.1)	5(2.6)	14
Total	816(100.0)	198(100.0)	1014

The most common maternal complication was post-partum haemorrhage 7.2% vs. 6.6% for EMCS and ELCS respectively OR: 1.11(0.59-2.07), P: 0.88. There was no statistical significant difference in this maternal morbidity between EMCS and ELCS (Table 4).

**Table 4**  
*Maternal Complications by CS type*

Complication	EMCS n=816	ELCS n=198	OR (95% C.I.*)
Mean EBL	464.3±307.0	421.8±268.8	T=1.65,p=0.09
Long hospital stay	24	4	1.47(0.18-12.28),p=1.0
Post-partum haemorrhage	59(7.2)	13(6.6)	1.11(0.59-2.07),p=0.88
Transfused blood	33(4.0)	3(1.5)	2.74(0.83-9.03),p=0.09
Mean postop PCV	31.8±5.1	32.9±4.7	T=2.36,p=0.019
Post-partum Anaemia	389(47.7)	73(36.9)	1.56(1.13-2.15),p=0.0068
Wound complication	7	1	1.71(0.21-13.94), p=1.00
Puerperal pyrexia	21	4	1.28(0.44-3.78),p=0.802
Hysterectomy	5(0.6)	0	2.69(0.15-48.90),p=0.59
Case fatality	1(0.12%)	1(0.51%)	0.24(0.015-3.88),P=0.35
Composite	539 (66.1%)	131(66.2%)	1.00(0.72-1.38),p 1.000

\*confidence interval

The women who had EMCS also suffered significantly higher incidence of postpartum anemia 47.7% vs. 36.9% OR 1.56 (1.13-2.15), P=0.0068. Two women died following Caesarean delivery in the period of review a case fatality of 0.2% (maternal mortality of 197 per 100,000). The neonates delivered via EMCS suffered significantly more Apgar score <7 at 5 minute 5.1% vs. 1.5% OR 3.5(1.08-11.50), P=0.021 and had more SCBU admission 7.1% vs. 2.6%, OR 2.9 (1.17-7.47), P=0.014 Table 5.

**Table 5**  
*Perinatal outcome by CS Type*

Complication	EMCS n=816(%)	ELCS n=198(%)	OR (95% C.I.)
Live birth	791(96.9)	195(98.5)	0.49(0.145-1.63),p=0.333
APGAR Score<7 at 5 minute	42(5.1)	3(1.5)	3.53(1.08-11.50),p=0.021
SCBU Admission	58(7.1)	5(2.6)	2.9(1.17-7.47),p=0.014
Early neonatal death	3(0.4)	1(0.5)	0.727(0.075-7.03),p=0.58
Fresh stillbirth	14(1.7)	1(0.5)	3.44(0.449-26.32),p=0.327
Macerated stillbirth	8(1.0)	1(0.5)	1.95(0.2424-15.694),p=0.70
Mean birth weight	3381.6±637.2	3248.0±549.4	t=2.40,p=0.017
Composite	125 (15.3)	11(5.6)	3.075(1.63-5.82),p=0.0002

The composite perinatal complications were 125 (15.2%) vs. 11 (5.6%) OR 3.075, P=0.0002. There were statistical significant difference. A total of 28 (2.8%) babies died, 3 (1.5%) of them were from those that had elective and 25 (3.1%) from those who had EMCS, a perinatal mortality rate of 27.6 per 1000 deliveries.

## DISCUSSION

The Caesarean delivery rate of 21.0% in this study was comparable to incidence of 22.2% reported in the city about a decade previously (15). This was lower than 25.3-27.6% from authors from South east region of Nigeria (5-6) and higher than 9.9-18% reported by authors from other parts of the country (7, 10, 16-19).

From more developed countries the incidences of 27.6-36.5% were reported (1, 4, 20). This rate was relatively stable over the period covered in this study. The stable trend could be attributable to the fact that the booked clients constituted the vast majority of the patients informing strict selection of cases right from prenatal period. Again the center selectively practiced trial of vaginal birth after Caesarean for women with one previous Caesarean delivery. Referral cases from private and other facilities probably attracted by the presence of resident obstetrician may have caused our observed high CS rate more so when most of the cases were already with some complications on arrival at the centre. The rising rates of CS has been attributed majorly to poor case selections (21), rise in primary CS, decline in VBAC and rising primary CS on request for no obvious medical and obstetric indications (4). Increasing willingness to perform CS on request even by older and more experienced obstetricians has been reported (22). The women, media and the clinicians therefore take the blame of this rising caesarean rates (23).

The EMCS constituted 80.5% similar to other reports (10, 18) and elective CS made up the 19.5%. This was different from reports from other authors who reported 9 EMCS out of every 10 cases of Caesarean deliveries (5, 7) and lower than 62-72.4% by other authors (6, 25). However, over the study period there seemed to be a significant increase in the rate of the elective CS and decline in emergency Caesarean delivery. The practice of low threshold for repeat caesarean for one previous CS on TVBAC contributed to the overall rise in CS rates. Most of the subjects in this study had prenatal care at the study center which seemed to allow proper case selection which in addition to the practice of repeat caesarean section for two or more previous CS, a prior CS with multiple pregnancy or breech presentation resulted in the rise in ELCS rate in our report. Again most of the obstetric management was directly supervised by the resident obstetrician. This probably ensured fair selection of CS cases based on indications.

Cephalopelvic disproportion was the leading indication for emergency Caesarean delivery as in other reports (5, 7, 10, 15-17, 19). On the other hand, repeat Caesarean section was the most common indication for the elective CS in this population. Our data confirmed the reports by other authors (5-7, 10, 16-17, 19) but contrasted with another report in the literature with malpresentation followed by previous

CS the leading Caesarean indications (8)

Post-partum haemorrhage with its consequent post-partum anaemia was the leading maternal morbidity similar to a previous finding in the setting (15). This contrasted with reported leading morbidity of sepsis by other authors (19, 25). This was significantly higher among the subset that had emergency Caesarean delivery. This compared closely with the reports from similar studies (5, 7). The case fatality of 0.2% though very important even a single dead, was lower than 0.6-0.8% in the literature (5-7, 15, 24-25).

The leading perinatal complications were birth asphyxia comparable to another report (19) and Special care baby unit admission. This was significantly higher among the neonates delivered at EMCS relative to the electively delivered ones. High rate of birth asphyxia has been previously reported (5, 19). The perinatal mortality rate was similar to the rate from southeast Nigeria (5) and lower than 6.4-16.6% by other authors (6-7, 15, 17, 19, 24).

This study drew its strength in its sample size however it was a hospital based study. A multicentre data will carry more evidence and therefore more generalisable. Again a well designed prospective study will be better than a retrospective one.

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