Relationship between Mode of Delivery, Obstetrics Complications and Foetal Presentation: A Five -Year Retrospective Study in a Tertiary Health Facility in Delta State, Nigeria

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Abstract

Background: Obstetric complications can vary from one clinical setting to another and this can be influenced by the socio-demographic characteristics of the mother and the availability of quality maternal health services. Both obstetric complications and foetal presenting parts and lie can influence the mode of delivery.

Aim: The present study aimed to determine the relationship between mode of delivery with obstetrics complications and foetal presentation.

Methodology: The study was a 5-year retrospective study of all deliveries from April 1st, 2018- 31st March 2023, at the study centre. Data such as maternal age, parity, booking status, type of gestation, gestational age, foetal presentation, mode of delivery and maternal diagnosis were extracted from the labour room register at the study centre. Data was analyzed using IBM SPSS version 21 and continuous and categorical data had their respective means and frequencies determined. The caesarean section (CS) due to obstetric complications and the CS rate due to abnormal foetal presentation were determined using a frequency table. Additionally, binary logistic regression was used to determine the more important predictor of CS between the obstetric complication and abnormal foetal presentation.

Results: There were 810 deliveries during the study period with 404 (49.9%) primiparas and 544 (67.1%) mothers were in the age range of 20-34 years. The CS rate was 57.0%, while 0.2% (2) had forceps deliveries. One hundred and thirty-seven (16.5%) mothers had hypertensive disorders of pregnancy, 41 (5.1%) mothers had isolated abnormal presentation/lie and 39 (4.8%) came with foetal distress. The occipito-anterior (OA) presentation was the commonest foetal presentation.Obstructed labour and foetal distress accounted for majority of the CS, however, abnormal presentation was the most important predictor of CS.

Conclusion: While the common obstetric complications in the study facility were hypertensive disorders of pregnancy, abnormal presentation and foetal distress, abnormal foetal presentation was the most important predictor of C/S.

Keywords: Obstetric complications, Foetal Presentation, Retrospective Study, Health facility

Introduction

Maternal mortality is unacceptably high in developing countries due to inequalities in access to quality health care services.¹ These gaps in developing countries continue to widen and worsen maternal indices in sub-Saharan Africa. About 287,000 maternal deaths occurred globally in the year 2020, and 95% of these deaths occurred in low and middle income countries.¹ In the year 2020, women died 82,000 due about to complications of pregnancy in Nigeria and most of these deaths were preventable.² mainly These deaths occur due to complications such as severe bleeding, hypertensive disorders pregnancy, in infections and unsafe abortion. These conditions are equally important causes of foetal outcomes adverse such as miscarriages, preterm delivery, asphyxia, low birth weight and intrauterine foetal death (IUFD).³These obstetric complications can vary from one setting to another and this can be influenced by maternal sociodemographic characteristics and access to quality maternal health services in the community.

A study carried out by Adelaja and Taiwo in South-Western Nigeria revealed that prolonged labour/obstructed labour, postpartum haemorrhage and foetal distress were the leading cause of maternal morbidity.⁴ In another study carried outby Olamijulo et al, also in South-Western Nigeria, hypertension in pregnancy, sepsis and post-partum haemorrhage were the leading causes of maternal mortality.⁵ In order to improve the outcome of pregnancy, a decision to terminate the pregnancy through the fastest route is often reached in complicated pregnancies and this route may be via CS or vaginal delivery depending on the prevailing circumstances. While the obstetric complication is often occasioned by the mother's condition, foetal parameters such as the birth weight and the foetal presenting

part may also influence the route of delivery. The present study aimed to determine the common obstetric complications and foetal presentation/lie and their relationship to the mode of delivery.

Materials and Methods

The study was a 5-year retrospective study of all deliveries from April 1st, 2018- March 31st, 2023 in Delta State University Teaching Hospital (DELSUTH), Oghara. DELSUTH is a tertiary health facility that serves as a referral centre for Delta state and some communities in Edo and Bayelsa States. The facility is located in Oghara town, a semi-urban community where the major occupations of the people include farming, trading and fishing. The facility has an Obstetrics and Gynaecology department that takes about 35-45 deliveries in a month and sees an average of 85 women in a month during the antenatal clinic. Ethical approval was obtained from the Ethics and Research Committee (HREC) of the hospital with the approval number: HREC/PAN/2024/005/0620. Α formal approval was also obtained from the DELSUTH management before the commencement of data collection.

All deliveries that occurred in the health facility during the study period were included in the study provided they were 28 delivered after weeks gestation. Secondary data from the labour room register such as maternal age, parity, booking status, type of gestation and gestational age were obtained for the study. Additionally, the foetal presentation, mode of delivery and maternal diagnosis were also obtained from the register. Data was entered into Microsoft Excel Spreadsheet and data cleaning was carried out before transfer to IBM SPSS version 21 for data analysis. Continuous data had their means determined and categorical data had their frequencies determined.

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The caesarean section (CS) rate of obstetric complications and CS rate of foetal presenting parts were determined using a frequency table. Logistic regression was performed to determine the most important predictor of caesarean section delivery among variables collected.

Results

There were 825 deliveries during the study period but 15 (1.8%) were excluded because they had incomplete data and as a result only 810 were used for the analysis of data. The mean age of the women was 30.9 ± 0.6 years, 230 (28.4%) of the 810 women had unsupervised pregnancy, 409 (50.4%) were 580 primpara, (71.6%)were booked/supervised 462 and (57.0%)delivered via caesarean section as seen in table I and table II.

Table I: Sociodemographic and ObstetricFeatures of Mothers

Variable	Frequency (%)
Age	
< 20 years	27 (3.3)
20-34 years	544 (67.1)
>34 years	239 (29.6)
Unsupervised pregnancies	230 (28.4)
Supervised in peripheral	161 (19.9)
centres	419 (51.7)
Supervised within facility	
Parity	
Para-one	409 (50.4)
Multipara	353 (43.6)
Grandmultipara	48 (5.9)
Mode of Delivery	
Caesarean Section (CS)	462 (57.0)
Vaginal Delivery (VD)	346 (42.7)
Forceps Delivery	2 (0.3)

Table II: Descriptive	statistics of maternal
age, parity, gestational	age and birth weight

Variable	Range	Mean (SD)
Maternal Age (years)	14-51	30.9 (6.0)
Parity	1-9	2.0 (1.4)
Gestational Age (weeks)	28-44	36.7 (3.6)
Birth Weight	0.5-4.9	2.7 (0.9)

Table III: Prevalence of ObstetricComplications

Obstetric Condition	Frequency (%)
Mothers without complications	413 (51.0)
Hypertensive Disorders	134 (16.5)
Foetal Distress	39 (4.8)
Abnormal Presentation	41 (5.1)
Multiple Gestation (MG)	37 (4.6)
Obstructed Labour	28 (3.5)
Antepartum Haemorrhage	27 (3.3)
(APH)	
Preterm PROM	30 (3.7)
Sickle Cell Diseases	9 (1.1)
HIV in Pregnancy	10 (1.2)
Diabetes Mellitus	3 (0.4)
Cord Prolapse	6 (0.7)
Oligohydramnios	8 (1.0)
Others	25 (3.3)

The commonest obstetric complication seen at the study area was hypertensive disorders of pregnancy with a frequency of 134 (16.5%), followed by 39 (4.8%) cases of foetal distress and 41 (5.1) cases of abnormal presentation/lie. The least conditions were oligohydramnios, cord prolapse and diabetes mellitus in decreasing order of occurrence as shown in table III.

Table IV: Maternal ObstetricComplications and Mode of Delivery

Obstetric Condition	CS (%)	VD (%)	Total
Mothers without	146	267 (64.6)	413
complications	(35.4)		
Hypertensive	108	26 (19.4)	134
Disorders	(80.6)		
Foetal Distress	34 (89.5)	4 (10.5)	38
Abnormal	34 (82.9)	7 (17.1)	41
Presentation/Lie			
Multiple Gestation	25 (71.4)	12 (28.6)	35
(MG)			
Obstructed Labour	25 (89.3)	3 (10.7)	28
Antepartum	23 (81.2)	4 (18.8)	27
Haemorrhage (APH)			
Preterm PROM	20 (60.6)	13 (39.4)	33
Sickle Cell Diseases	7 (77.8)	2 (22.2)	9
HIV in Pregnancy	7 (70.0)	3 (30.0)	10
Diabetes Mellitus	2 (66.7)	1 (33.3)	3
Cord Prolapse	6 (100.0)	0 (0.0)	6
Oligohydramnios	7 (87.5)	1 (12.5)	8

Forceps delivery occurred in 2 (0.2%) cases: one was a case of peripartum cardiomyopathy and severe preeclampsia and the other delayed second stage There were 77 (16.6%) elective CS as against 385 (83.4%) emergency CS. The majority of obstetric conditions seen from the study were delivered via caesarean section, however, the conditions with the highest proportion of CS deliveries included cord prolapse 100.0% CS deliveries, foetal distress with 89.5% CS deliveries and obstructed labour with 89.3% CS deliveries as shown in table IV.

Table V: Foetal Presenting Part/ Lie andtheir Route of Delivery

Presenting Part/Lie	CS (%)	VD (%)
Occipito Anterior	320 (56.9)	242 (43.1)
Right Occipito Anterior	35 (41.2)	50 (58.8)
Left Occipito Anterior	29 (42.6)	39 (57.4)
Frank Breech	54 (85.7)	9 (14.3)
Transverse Lie	16 (100.0)	0 (0.0)
Face	2 (50.0)	2 (50.0)
Occipito Posterior	3 (100.0)	0 (0.0)
Right Occipito Posterior	2 (66.7)	1 (33.3)
Oblique	1 (100.0)	0 (0.0)
Footling	1 (100.0)	0 (0.0)
Hand	1 (100.0)	0 (0.0)
Mentum Posterior	1 (100.0)	0 (0.0)

CS- Caesarean Section; VD- Vaginal Delivery; Forceps deliveries: 2 cases

The commonest foetal presenting part was the occipito-anterior (OA) position with 566 (70.1%), followed by right occipito-anterior (ROA) position with 85 (10.5%) cases, left occipito-anterior (LOA) position with 68 (8.4%) cases and frank breech with 63 (7.8%) cases. Additionally, transverse lie were 16 (2.0%), face presentation 4 (0.5%), occipito-postrior (OP) position 3 (0.4%) cases and right occipito-posterior (ROP) position with 3 (0.4%) cases.

Using logistic regression, the authors assessed the odds of CS based on maternal complications and foetal presentation. The results revealed that fetal presentation is a significant predictor of CS delivery 1.003-1.055; (AOR=1.03; 95%CI: р < 0.0001), while maternal obstetric

complications showed a negative association (AOR=0.829; 95%CI: 0.787-0.829; p < 0.0001).

Discussion

Two-third of the participants were middle age women of 20-34 years and 3.3% were teenage mothers. This is reflective of the high fertility rate among middle age women in developing countries. Obarisiagbon et al in University of Benin Teaching Hospital, Southern Nigeria, reported 88.2% women in their study were in the middle age and 0.8%were teenage mothers.⁶Abubakar et al in Kaduna, North-Western Nigeria, reported 14.1% of the participants in their study were teenage mothers while 58.7% were middle age women.⁷ The higher prevalence of teenage mothers reported by Abubakar et al is reflective of a sociocultural issue of early marriage in northern Nigeria and in some other parts of Nigeria. Early pregnancy and child birth has medical implications that can compromise pregnancy, labour and delivery but fortunately enough, the proportion of teenage women in this 5-year review is small, notwithstanding, is still of concern.

More than a quarter of the participants did not have their pregnancy supervised and this could have delayed the early identification and management of high-risk pregnancy. Unsupervised pregnancy is still prevalent in Nigeria because many pregnant women still prefer patronize to traditional birth attendants during. Abubakar et al reported 53.9% unsupervised pregnancy in their study.⁷ Nigeria is reported to have an average of 46.5% rate of underutilization of antenatal care with 61.1% in rural areas and 21.4% in urban areas. Rate of underutilization of ANC was reported to be highest in North-Central Nigeria with 69.3% average, 48.8% in urban area and 76.6% in rural areas.

The South-West had the lowest rate of underutilization of ANC with10.2% average, 7.8% in urban and 22.6% in rural area.⁸

More than half (57.0%) women had CS delivery in the present study and 2(0.2%)instrumental delivery via forceps. Interventional deliveries are high in referral centres because many of these cases are usually complicated pregnancies referred from primary/secondary health facilities for expert management. The CS rate was highest among women with foetal distress, obstructed labour and abnormal presentation. Abubakar et al reported a CS rate of 7.8% in their study, 23.8% forceps delivery and 1.5% vacuum delivery.⁷ In a study by Eguvbe et al in Southern Nigeria, the prevalence of CS was 45.7%, and in another study in Lagos, South-Western Nigeria, CS rate was reported to be 40.1% among singleton mothers.^{9,10} From the present study, a significant proportion of these women did not have supervised pregnancies and as a result 83.4% of these CS deliveries were as emergencies. The high proportion of emergency CS delivery could

have adversely affected the pregnancy outcome; however, this is beyond the scope of this study.

The three obstetric most common complications encountered were hypertensive disorders of pregnancy (HDP), abnormal foetal presentation/lie and foetal distress with prevalence of 16.5%, 5.1% and 4.8% respectively. The pattern of obstetric complications from the present study differs from reports by Abubakar et al and Akpan et al.7,11Obstructed labour featured as one of the three most common causes of obstetric complications in these two studies probably because the population of teenage deliveries for each of these studies was more than 10% as against the proportion of teenage deliveries in the present study that was 3.3%. Hypertensive disorders of pregnancy

was found to be the leading cause of maternal morbidity in the present study and it has been reported to be a leading cause of maternal morbidity and mortality in many other studies. The finding thus informs the need for prioritizing the care of women with this condition at the study centre.

Cephalic presentation occurred in more than 90% of cases with the occipito-anterior position topping the list, followed by ROA and LOA positions. Also, breech occurred in 7.8%, transverse lie in 2.0% while footling breech, hand presentation and oblique lie occurred prevalence. each at 0.1% Transverse lie. OP position, oblique position, footling, hand presentation and MP all had 100% CS delivery. In a study by Olaniyan, in Warri, Southern Nigeria, foetal presenting parts were accessed on the 3rd trimester via ultrasonography and cephalic presentation occurred in 80% of their participants, breech occurred 13.3% and transverse lie occurred in 5.6%.¹²In another study by Ahmed et al in Kano, North-Western Nigeria, the prevalence of breech delivery was similar to our occurring at 2.3% among studied participants.¹³When obstetric complications were compared to foetal presenting part using binary logistic regression to predict CS delivery, foetal presenting part/lie was a more important predictor of CS delivery than obstetric complications. In a study that was conducted by Irwinda et al, they predicted CS rate from maternal and foetal factors and used these to develop a scoring system for CS. Though in their study, they found obstetric complication to be a more important predictor of CS than foetal presentation. This difference may be due to the different methods and population studied. Their study was a prospective study and the present study is a retrospective study with no control over pre-study bias.

Also, the study populations are different and as a result the sociodemographic characteristics may influence the findings. Despite this limitation, the present study has given an insight into the predictors of CS deliveries at the study centre. However, there is a need to carry out a prospective large-scale study in Nigeria to further determine the more important predictors of CS delivery.

Conclusion:

The leading causes of maternal obstetric complications were hypertensive disorders of pregnancy, abnormal presentation and foetal distress. However, the most important predictor of CS was abnormal foetal presentation.

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