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Clinical Attributes and Socio-Demographic Characteristics of Patients Managed for Eclampsia in a Tertiary Hospital in Nigeria

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Abstract

Eclampsia is a serious obstetric complication that, especially in developing countries, is linked to high rates of maternal and perinatal morbidity and mortality. The study's goal is to assess the clinical characteristics of eclampsia, the maternal and perinatal outcomes and proffer suggestions for improvement. The cases of eclampsia managed at the University of Benin Teaching Hospital (UBTH) in Benin City, Nigeria, for over 5 years (from 2015 to 2019) were the subjects of the study. The medical records library, special care infant unit, labour ward, theatre, postnatal wards, and emergency room records were retrieved. SPSS version 23 was used to analyze the generated data. Eclampsia occurred in 16.7 out of every 1000 deliveries. The majority (66.9%) of eclampsia cases included women; between the ages of 20 and 35, who were unbooked (98.1%), and nulliparous (61.3%). 73.8 percent of the cases involved antepartum eclampsia, and 71.9 percent of deliveries were emergency caesareans. Eclampsia contributed to 31.7% of all maternal deaths, had a case fatality rate of 18.97%, and had a mother mortality ratio of 316/100,000 births. Eclamptic deliveries had a 149/1000 perinatal death rate. Pulmonary oedema, renal failure, HELLP syndrome, cerebrovascular accident, and disseminated intravascular were determinant factors in maternal mortality. Eclampsia remains a significant factor in maternal morbidity and mortality, particularly in resource-limited countries. Risk factors such as nulliparity and unbooked status were linked to increased prevalence. It also shows the need for early referral and timely management of the disease.

Keywords: Eclampsia, Foetomaternal outcome, Maternal mortality, Antenatal care.

INTRODUCTION

Hypertensive disorders are the most common medical complication of pregnancy. They are a progressive disease that tends to cause severe morbidity, lasting disablement and mortality in both mothers and their babies (Abalos *et al*., 2015). Hypertensive disorders account for about 14% of maternal deaths (Say *et al*., 2014) and are the second leading cause of maternal death worldwide, after haemorrhage (Abalos *et al*., 2015; Say *et al*., 2014; Kassebaum *et al*., 2016).

Hypertensive disorders of pregnancy (HDP) encompass chronic hypertension, gestational hypertension, preeclampsia/eclampsia, and preeclampsia superimposed on chronic hypertension. Pre-eclampsia is the occurrence of hypertension and significant proteinuria after 20 weeks of gestation (Wilkerson & Ogunbodede, 2019). It is a progressive disease that progresses to eclampsia without intervention.

Eclampsia is considered a sequela of severe preeclampsia. It is commonly defined as the new commencement of generalised tonic, clonic, convulsions and/or unexplained unconsciousness during pregnancy or postpartum in a woman with signs and or symptoms of preeclampsia (Mattar & Sibai, 2000; Warrington, 2015). It typically occurs after the 20th week of gestation or within 10 days postpartum (Munro, 2000a). Nevertheless, Douglas and Redman (1994) reported that eclampsia occurred in the absence of hypertension with proteinuria in 38% of cases.

Similarly, Mattar and Sibai (2000) reported that 16% of the cases studied were not hypertensive.

The incidence of eclampsia varies by region. The overall global burden of eclampsia is 1.4% (Abalos *et al*., 2013). The incidence of eclampsia is 0.1% in Europe, 2.7% in Africa, 0.03% in the United Kingdom, 0.03% in Qatar, and 5.36% in Ethiopia (Abalos *et al*., 2015; Abalos *et al*., 2013; Getaneh *et al*., 2021) In Nigeria incidence of 0.62% to 1.99% have been reported (Onoh *et al*., 2019; Okoror, 2019)

Mortality from hypertensive disorders in pregnancy increases significantly with the occurrence of eclampsia. Eclampsia is responsible for about 14% of l maternal deaths worldwide (Abalos et al., 2013). Perinatal morbidity and mortality are mainly due to preterm birth, intrauterine asphyxia from placenta insufficiency, trauma during operative deliveries and effects of the drugs used to control convulsions (Abalos *et al*., 2015; McKenzie & Trotman, 2019; George & Jeremiah, 2009). This can result in intrauterine growth restriction or death, neonatal respiratory distress syndrome, and increased need for hospitalization for neonatal intensive care (George & Jeremiah, 2009; Mor *et al*., 2015).

Pre-eclampsia/eclampsia causes up to 10-25% of perinatal loss and 25% of low birth weight worldwide, although in developing countries perinatal mortality rates as high as 40% have been reported (Munro, 2000b; Douglas & Redman, 1994). It increases the risk of placental abruption, caesarean section, and intensive care hospitalization. Mortality from eclampsia often results from cerebrovascular accidents, cardiac failure, pulmonary oedema, acute renal failure, pulmonary embolism, and aspiration pneumonia (Getaneh *et al*., 2021; Nwafor, 2019; Vogel *et al*., 2014).

High-risk factors for developing pre-eclampsia include a history of hypertension in a previous pregnancy, chronic hypertension, chronic kidney disease, diabetes mellitus and autoimmune diseases (Milne *et al*., 2005; Duckitt & Harrington, 2005). Moderate risk factors include age 40 years and above, primigravidity, the interval from last pregnancy of >10 years, body mass index of >35 at presentation, multiple pregnancy, and family history of pre-eclampsia/eclampsia (Duckitt & Harrington, 2005; Bartsch *et al*., 2016).

Reported complications were similar in all regions but higher in developing countries (Abalos et al., 2015These include HELLP syndrome, disseminated intravascular coagulopathy, acute renal failure, and cerebrovascular accidents.

Feto-maternal outcome indicators included the number of seizures before presentation, gestational age at onset, level of consciousness at presentation, seizure to delivery interval, route of delivery, length of hospital stay, and any underlying associated co-morbidities (Okoror, 2019; Nwafor, 2019; Vogel *et al*., 2014).

Feto-maternal morbidity and mortality from eclampsia can be reduced by providing pre-conception care, access to optimal antenatal care, early recognition of risk factors, diagnosis, careful monitoring and timely interventions (Abalos *et al*., 2015; Duckitt & Harrington, 2005; Bartsch *et al*., 2016). The only cure for eclampsia is delivery of the foetus and removal of the placenta. Eclampsia continues to contribute significantly to maternal and perinatal adverse outcomes. Its evolution and manifestation are still very unpredictable. Therefore, there is a need to continue to explore the determinants of eclampsia, its manifestations, treatment modalities, and other interventions that impact the clinical management of eclampsia. The study aimed to determine socio-demographic characteristics, clinical attributes and outcomes of women managed for eclampsia in UBTH.

MATERIAL AND METHODS

This was a retrospective cross-sectional analytic study of all patients who were managed for eclampsia at the University of Benin Teaching Hospital (UBTH), Benin City from January 2015 to December 2019. UBTH is located along the Benin-Lagos highway, Ugbowo, Benin City. Benin City is the capital of Edo state, in the South-South geopolitical zone of Nigeria. Patients are usually referred from general hospitals, government-owned health centres, private medical centres and other departments in the hospital. It serves as a major referral centre for Edo, Delta, Ondo and Kogi State.

Inclusion and exclusion criteria: All cases of Eclampsia managed in the period under review were included in the study while cases with incomplete data were excluded. Patients with a documented history of epilepsy and patients with other causes for convulsions (like infection, electrolyte imbalance, toxic or metabolic encephalitis, brain tumours, and trauma) were excluded from the study. Ethical clearance was obtained from the hospital's ethical committee.

A database was generated containing information on socio-demographic characteristics and relevant clinical information in line with the study's aim and objectives. The outcomes of interest were the sociodemographic profile of the patients and the clinical attributes including foetomaternal outcome of women with eclampsia. This was done using a self-designed study proforma. The statistical analysis was done using the statistical package for social sciences (SPSS) version 23. Results will be presented as whole numbers and percentages for categorical variables while continuous variables will be expressed as mean values with standard deviations.

RESULTS AND DISCUSSION

RESULTS

Table 1: Socio-demographic characteristics

Characteristics	Number (%)
Age	
<20years	18 (11.3%)
20-35years	107 (66.9)
>35years	35 (21.9%)
Level of education	
Primary	54 (33.8)
Secondary	69 (43.1)
Tertiary	37 (23.1)
Occupation	
Employed	107 (66.9)
Unemployed	53 (33.1)
Residential address	
Rural	61 (38.1)
Urban	99 (61.9)

Table 2: Clinical characteristics of eclamptic women

Characteristics	Number (%)	Total number of deliveries n (%)	Risk per delivery (%)
Parity			
Para 0	98(61.3)	3477 (33.3)	3.96
Para 1-4	57(35.6)	6740 (64.61)	0.85
Para 5 and above	5(3.1)	214 (2)	2.34
Booking statues			
Booked	3(1.9)	8430 (80.8)	0.036
Unbooked	157(98.1)	2001 (19.2)	7.85
Gestational age			
<34weeks	18(11.3)	294 (2.82)	6.12
34-36^{+6}weeks	51(31.9)	495 (4.74)	10.30
>37weeks	91(56.9)	9642 (92.44)	0.94

Table 3: Clinical characteristics of eclamptic women

Characteristics	Frequency (%)	Maternal mortality number (%)	CFR (%)
Consciousness level			
Conscious	54(33.8)	3(9.1)	5.56
Unconscious/sub-conscious	106(66.3)	30(90.9)	28.30
Convulsion episodes			
Single	83(51.9)	5(15.2)	5
Multiple	77(43.1)	28(84.8)	36.36
Blood pressure range			
Severe	117(73.1)	26(78.78)	22.22
Mild	43(26.9)	7(21.21)	16.27
Fit to delivery interval			
<12hours	79(49.5)	7(12.12)	8.86
12-24hours	67(41.9)	20(57.57)	29.85
>24hours	14(8.8)	6(30.30)	42.86

Table 4: Clinical characteristics of eclamptic women

Characteristics	Number (%)
Time of eclampsia	
Antepartum	118 (73.8)
Intrapartum	33 (20.6)
Postpartum	9 (5.6)
Route of delivery	
Vaginal (including forceps delivery)	44 (27.5)
Caesarean section	115 (71.9)
Died undelivered	1 (0.6)

Table 5: Maternal outcomes

Complications	Frequency	Percentage (%)
Pulmonary oedema	38	23.75
HELLP SYNDROME	17	10.625
Renal dysfunction	15	9.37
CVA	3	1.87
DIC	5	3.12
ICU ADMISSION	83	51.87
DEATH	33	20.62

Table 6: Perinatal outcome

Complications	Num. of cases	Percentage (%)
IUGR	17	10.625
IUFD/Still birth	11	6.87
Prematurity	28	17.5%
LBW babies(<2.5kg)	42	26.25
SCBU admission	49	30.62
RDS	23	14.37
Perinatal death	26	16.25

RDS respiratory distress syndrome, LBW= Low birth weight
SCBU = Special care baby unit, IUGR = Intrauterine growth restriction

Eclampsia cases numbered 174 throughout the review period and there were 10,431 deliveries, translating to a prevalence of 1.67% of all deliveries. Since only 160 case notes could be recovered, 160 cases were used in the analysis. Eclampsia was the root cause of 33 of the 104 maternal fatalities that occurred during the period under consideration.

With an eclampsia-related maternal mortality ratio of 316/100000 and a case fatality rate of 18.97%, this suggests that eclampsia was a contributing factor in 31.7% of all maternal fatalities. The maternal mortality ratio for the period was 997 per 100,000.

There were 151 births (14 singletons, 5 sets of twins and one triplet). There were 26 perinatal deaths (11 stillbirths and 15 early neonatal deaths), giving a perinatal mortality ratio of 149/1000 eclamptic deliveries.

The age range of 20 - 35 years represented the majority of eclampsia cases (66.9%), although the age range of < 20 years represented the highest risk per delivery (34.56%). There were 106 (66.2%) females with secondary education, while 107(66.9%) of them were employed

Nulliparous women made up six out of ten [98, (61.3%)] eclamptic patients. Expectedly, 98.1 percent of the cases were unbooked, while only one (1) in every 10 patients [3 (1.9%)] were booked. Booked cases had a risk of 0.036% for eclampsia, but unbooked cases had a risk that was significantly greater (7.85%). Although the incidence of eclampsia was higher (6–10%) in preterm deliveries than at term (0.94%), it was slightly more common at term (56.9%) compared to earlier gestations.

Maternal mortality due to eclampsia increased with high blood pressure readings and the number of convulsions experienced before presentation, with a case fatality rate of up to 36.36 percent for those who experienced multiple convulsions compared to just 5 percent for those who experienced a single convulsion. Similar to this, 66.3% of women reported being unconscious or sub-conscious, and this group was responsible for 90.9% of all maternal deaths from eclampsia throughout the study period.

Within the first 12 hours following the onset of the first seizure, 49.5% (or half) of the women delivered, and these women were responsible for 12.12% of maternal deaths. Maternal mortality among women who gave birth between 12-24 hours was 57.57%, but the case fatality rate was lower than that of women who gave birth within 24 hours (table 3). Eclamptics delivered >24 hours after the initial seizure had occurred had the highest case fatality rate of 42.6% (Table 3). The majority of eclampsia cases (73.3%) occurred during the antepartum stage, whereas postpartum eclampsia was the least frequent type (5.6%).

According to Table 5, 7 out of every 10 patients with eclampsia (71.9%) underwent abdominal delivery. Except for one (1) patient who died while not yet delivered, the remainder of the patients were delivered vaginally, either naturally or with forceps.

More than half of eclamptic patients received ICU admissions (51.87 %). Pulmonary oedema, HELLP syndrome, and renal dysfunction were the most common complications, accounting for 23.75%, 10.63%, and 9.37%, respectively.

The vaginal delivery group had a greater rate of neonatal mortality. Eleven (11) of the forty-four (44) patients who had vaginal deliveries had intrauterine fetal mortality. Seven of the 33 remaining vaginal births resulted in early neonatal deaths (21.21%). This was higher than 7.0% of neonatal mortality linked to abdominal delivery. 30.62% of neonates were admitted into the special care baby unit. The commonest complications were prematurity and low birthweight accounting for 26.25% and 17.5% respectively.

DISCUSSION

Eclampsia has remained a challenging illness, particularly in underdeveloped nations with consequent maternal and perinatal morbidity and mortality. In this study, there were 16.7 cases of eclampsia for every 1000 deliveries. This figure is comparable to the 1.66% reported in Lagos by Fabamwo *et al*., (2007) and 1.75% in Kano by Abdullahi *et al*., (2013), although it is lower than the 1.99% reported in Benin City (Okoror, 2019), the 4% reported in Abakaliki, (Onoh *et al*., 2019) and the 9.42% reported in Kano (Tukur *et al*., 2007).

In this study, 31.7% of all maternal deaths were due to eclampsia, which is consistent with other researchers' reports (Onoh *et al*., 2019; Okoror, 2019; Yakasai & Gaya, 2011) This rate was higher than the 11.2% recorded in Qatar (Sharara *et al*., 2019) but lower than the 39.2% and 43.1% reported by Jido (2012) and Tukur *et al*., (2007) respectively. The bulk of the patients (98.1%) in this study were unbooked, and a third of the patients presented unconscious, which contributed significantly to the overall maternal mortality.

The incidence of eclampsia is related to the utilization of antenatal services. The higher incidence in this study is primarily due to the under-utilization of antenatal care services. Nine (9) out of every ten (10) patients in this study were unbooked and were referred. These referral centres are primarily staffed by unskilled workers. The contrast is what obtains in developed comparable to Okoror *et al*.,'s reports., (2013) demonstrated in their United Kingdom study, a gradual reduction in the incidence and mortality from eclampsia. This was attributed to the implementation and utilization of comprehensive antenatal care (O'Connor *et al*., 2013).

The disease's lethality was shown by the case fatality rate (CFR), which was 18.97%. This figure exceeds both the value published by other studies, (Onoh *et al*., 2019; Tukur *et al*., 2007; Jido, 2012) and the value (15.96%) previously reported from the same institution (Okoror, 2019).

Four (4) out of every ten (10) patients had several fits, and the majority of patients (66.3%) were unconscious at presentation, had severe blood pressure range (73.1%), and had a lengthy fit to delivery interval (> 12 hours). This was why high CFR was identified. These are elements that raise maternal mortality from eclampsia (Getaneh *et al*., 2021; Sunita Mor *et al*., 2015; Nwafor, 2019).

Eclampsia was more prevalent in nulliparous women, unbooked parturients and the antepartum period. The most common route of delivery was the abdominal route. Similar outcomes were reported by other authors.(Abdullahi *et al*., 2013; Okoror, 2019). Although Yakasai and Gaya (2011) and Nwafor (2019) had comparable outcomes, their delivery route was primarily, vaginal.

Although the study's maternal mortality rate for eclampsia was high (316/100,000), it was comparable to Okoror *et al*.,'s reports of 318/1000 but higher than 254/100,000 reported by Yankassai and Gaya (2011). The requirement for quick referral to a tertiary hospital with a standard intensive care unit is highlighted by the fact that just over half (51.87%) of the eclamptic women were admitted to the intensive care unit. Pulmonary oedema, renal failure, HELLP syndrome, cerebrovascular accident, and disseminated intravascular coagulopathy were the main side effects noted in this study.

The perinatal mortality rate in this study was 149 per 1000 live births, which is higher than that reported in Nnewi, southeastern Nigeria (69/1000) by Adinma (2013), but lower than that reported in Ebonyi (174/1000) by Nwafor (2019) and 312/1000 reported in northern Nigeria by Tukur *et al*., (2007). The most common delivery method is a Caesarean section, which has a lower perinatal mortality rate than vaginal delivery. Other studies have recorded similarly favourable results (Milne *et al*., 2005; Abdullahi *et al*., 2013; O'Connor *et al*., 2013). The low birth weight associated with preterm birth is the most frequent neonatal complication and a significant contributor to early neonatal death.

CONCLUSION

Eclampsia remains a significant factor in maternal morbidity and mortality, particularly in resource-limited countries. In this study, risk factors such as nulliparity and unbooked status were linked to increased prevalence; as a result, eclampsia prevention requires good prenatal care. The outcome determinants noted in this study included an increased number of seizures, increased interval between seizures and birth, severity of blood pressure, and level of consciousness at the onset. It also shows the need for early referral and timely management of the disease. Increased seizure frequency, longer time between seizures and birth, the severity of blood pressure, and level of consciousness at the onset were among the outcome variables identified.

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