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Epidemiology of Severe Preeclampsia and Eclampsia in Ilorin, Nigeria

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ABSTRACT: This study was carried out over a 10-month period in the University of Ilorin Teaching Hospital to determine the frequency and epidemiological factors of severe preeclampsia and eclampsia in Ilorin, North-central Nigeria. This was a prospective study of severely preeclamptic and eclamptic patients admitted to the labour ward of the UITH. Patients with normal pregnancies who agreed to participate were the control group. Demographic, clinical variables, maternal and foetal outcomes, and, complications were assessed.

One hundred women (50 study group & 50 control group) participated in the study. Statistically significant findings among the study group included lower GA at delivery ($p=0.0001$), family history of hypertension ($p=0.02$), new partner (0.001), more interventions at delivery ($p=0.000$), higher number of preterm deliveries (0.000). Though 2 maternal deaths and 5 perinatal deaths were recorded in the study group, none occurred in the control group.

Deeper understanding of the epidemiology of severe preeclampsia and eclampsia is very important to finding ways to further lower its contribution to maternal mortality in our societies.

Keywords: Severe preeclampsia, eclampsia, hypertension, epidemiology, Ilorin

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Introduction

Hypertension is a common disorder in pregnancy and about 10% of pregnant women will have a high blood pressure during pregnancy (Duley 2009). Hypertensive diseases in pregnancy include preeclampsia/eclampsia, gestational hypertension and chronic hypertension (WHO 2011). Preeclampsia is a condition characterized by an elevated blood pressure and proteinuria, developing after 20 weeks of gestation. Eclampsia is the occurrence of seizures in a woman with preeclampsia that cannot be attributed to other causes (Onuh and Aisien 2004). Although hypertensive disorders of pregnancy are an important cause of severe acute morbidity, long-term disability and death among mothers and babies, preeclampsia/eclampsia stand out among them for its impact on maternal and neonatal health (WHO 2011). Indeed, preeclampsia remains an important cause of maternal and perinatal mortality and morbidity (Cunningham et al 2001, Onuh and Aisien 2004, Duley 2009, Ebeigbe and Aziken 2010).

There are many epidemiologic factors associated with these diseases. It has been described as a disease of the young, primigravidae (Aali et al 2004), most common in those with little or no form of antenatal care (Ebeigbe and Aziken 2010). It is also thought to have some genetic predisposing factors as having a family history of preeclampsia or chronic hypertension predisposes to preeclampsia (ACOG 2001, Roes et al 2005).

The aim of this study was to determine the frequency and epidemiological factors of severe preeclampsia and eclampsia in Ilorin, North-central Nigeria.

Patients and Methods

This was a prospective study of severely preeclamptic and eclamptic patients admitted to the labour ward of the UITH. The UITH ethical review committee approved the study. The study population included pregnant women diagnosed with severe preeclampsia, whether booked and attending antenatal clinic of the Department of Obstetrics and Gynaecology or referred to the Department from other hospitals. Consenting patients with normal pregnancies presenting at the labour ward of the UITH were recruited to serve as controls. Excluded from the study were women with a medical history associated with chronic medical disorders such as diabetes mellitus and chronic hypertension in pregnancy.

Demographic and clinical variables of age, parity, booking state, blood pressure on admission, class of diagnosis, maternal and foetal outcome, and, complications were obtained from the case folders of the patients while on admission in the labour room. Informed consent was obtained from either the patient or a person who had responsibility for the care of the patient while on admission in the hospital.

Definition of severe pre-eclampsia was based on blood pressure $\geq 160/110$ mm Hg measured on two consecutive occasions 6h apart, or proteinuria of $\geq 5\text{g}/24$ or $>2+$ on urine dipstick in a pregnant woman after 20 weeks gestation. Other criteria included pulmonary oedema, evidence of respiratory compromise, epigastric or right upper quadrant pain, and hepatic rupture, cerebral manifestations (headache, visual disturbances and urine output $<400\text{ml}/24\text{h}$). Eclampsia was defined as the occurrence of convulsions in a pre-eclamptic patient (hypertension of $\geq 140/90$ and proteinuria and/or oedema) not related to other causes.

EPI-Info version 15.0 was used for statistical analysis of data. The student's T-test was used to test for relationship for continuous data and Chi-square for categorical data. A *p*-value less than 0.05 was considered significant.

Results

The study was conducted over a 10 month period. Data were collected and analyzed from 50 subjects and 50 controls. There were 1885 deliveries during that period. The mean age of the subjects was 28.48 ± 5.02 years while that of the control was 27.06 ± 4.24 years (this was not statistically significant: $p = 0.10$). The 2 groups also had similar gravidity; the cases had mean gravidity of 2.7 ± 1.78 and for the controls it was 2.5 ± 1.5 ($p=0.60$). Of the 12 eclamptics, 8 (67%) were primigravidae.

The mean gestational age at delivery was 35.42 ± 4.43 weeks in the cases and was significantly lower than 39.42 ± 1.91 weeks in the controls ($p = 0.00$). The mean systolic and diastolic blood pressures on admission among the cases were 184.2 ± 27.04 mm Hg and 116.6 ± 16.49 mm Hg respectively. The mean systolic and diastolic blood pressures on admission among the controls were 115.4 ± 16.4 mm Hg and 74.6 ± 11.60 mm Hg respectively.

Forty percent (40%) of the cases were primigravidae and this was not significantly different from 28% among the controls ($p=0.2$). The number of controls that received antenatal care in UITH (66%) was significantly higher than 44% in the subject group ($p=0.03$). Also, 22% of the cases had a family history of hypertension

($p=0.02$) while 16% reported that a new husband/partner fathered the pregnancy ($p=0.01$). These two factors were statistically significant. The mean gravidity and inter-pregnancy interval between the 2 groups were not statistically significant ($p=0.60$ and $p=0.54$ respectively). Tables 1a and 1b show the demographic characteristics of the 2 groups.

Table 1: Demographic characteristics in the two groups

(1a)

Variables	Cases Mean \pm SD	Controls Mean \pm SD	P value
Age in yrs	28.48 \pm 5.02	27.06 \pm 4.24	0.10
Gestation in wks	35.42 \pm 4.43	39.42 \pm 1.91	0.00
Gravidity	2.7 \pm 1.78	2.5 \pm 1.5	0.60
Inter-pregnancy interval in months	42.8 \pm 35.2	38.6 \pm 14.9	0.54

(1b)

Variables	Cases (%)	Controls (%)	P value
Gravidity			
Primigravida	20 (40)	14 (28)	0.20
Booking Status			
Booked	22 (44)	33 (66)	0.03
Positive Family History			
Yes	11 (22)	3 (6)	0.02
Change of Husband			
Yes	8 (16)	1 (2)	0.01

Table 2 shows the mode of delivery in this study. There was a significantly higher rate of cesarean delivery among the subjects than the control ($p=0.00$). There were also significantly higher preterm deliveries among the cases (58%) than 16% among the controls ($p=0.00$). There were 2 maternal deaths and 5 perinatal deaths among the subjects and none among the controls.

Table 2: Mode of delivery among the subjects and the controls

Variables	Cases (%)	Controls (%)	P value
Delivery Method			
Normal Vaginal	9 (18)	41 (82)	0.00
Vacuum/Forceps	2 (4)	0 (0)	
Caesarean Section	39 (78)	9 (18)	

Discussion

Preeclampsia and eclampsia are hypertensive disorders that occur in pregnancy and are fraught with many complications. They are also associated with a high mortality rates both of the fetus and of the mother (Cunningham et al 2001, Aali et al 2004, Onuh and Aisien 2004, Duley 2009, Ebeigbe and Aziken 2010, WHO 2011).

Young age and primigravidity were not prominent features in this study among those with severe preeclampsia. This is unlike other studies that showed that the young primigravidae is most at risk of preeclampsia. However, primigravidity is still a factor in the development of eclampsia as shown in many other studies (Aali et al 2004, Aboyeji et al 2004, Ebeigbe and Aziken 2010,). The age factor in both preeclampsia and eclampsia may be due to increasing older age at starting family among many females.

The mean gestational age at delivery was significantly lower among the women with severe preeclampsia and eclampsia. This agrees with the findings reported by researchers (Duley 2009, George and Jeremiah 2009, Ferrazzani et al 2011). Preterm birth in pre-eclampsia has been attributed to the effect of the condition on blood supply to the placenta, leading to poor intrauterine growth which can then precipitate preterm birth (Ferrazzani et al 2011).

Severe preeclampsia and eclampsia were significantly higher among the unbooked than booked patients. This was also reported from other studies in Nigeria and underscores the importance of antenatal care in early identification and adequate intervention in the management of severe preeclampsia and eclampsia (Aboyeji et al 2004, Ebeigbe and Aziken 2010,).

Having a family history of preeclampsia is one of the documented factors associated with severe preeclampsia and eclampsia. This was shown in this study and agreed with earlier studies (Roes et al 2005, Bezerra et al 2010). Both studies showed that having a personal history or a family history of hypertension is a risk factor for severe preeclampsia.

The inter-pregnancy interval in this study was higher in the cases, but was not statistically significant. Studies show that the longer the inter-pregnancy interval, the higher the chances of developing preeclampsia in women with no previous history of

preeclampsia (Milner et al 2001, Olga et al 2001). In this study, the change in partner is significantly higher among the preeclampsics than the control. This supports earlier studies (Trupin et al 1996) although recent studies suggest that the interpregnancy interval, which tend to be longer in the women who change partners may as well be responsible for the increase in the susceptibility of these women to developing preeclampsia (Li and Wi 2000, Olga et al 2001).

The maternal case fatality rate was 4%. This was lower than that reported from Benin, Nigeria where the maternal case fatality rate was 10.7% (Ebeigbe and Aziken 2010). It is however higher than the figures from developed countries where it was reported to be 1.8% in the United Kingdom (Douglas and Redman 1994), no maternal death was reported in another series from the UK (Tuffnell et al 2005), and 1.3% from the Netherlands (Zwart et al 2008). This disease entity, hypertensive diseases in pregnancy, is one of the main direct causes of maternal death and causes 12% of maternal deaths in Nigeria (HERFON 2007). In Ilorin, a study from this center in 2007, reported that hypertension in pregnancy was the most important cause of maternal mortality, accounting for 27.8% of maternal deaths in this center (Aboyeji et al 2007).

The causes of maternal mortality are often inseparable from causes that lead to perinatal mortality (Pattinson et al, 2011). The perinatal case fatality rate was 10%. This was slightly lower than that reported from Benin, Nigeria, where it the perinatal case fatality rate was 15% (Igberase and Ebeigbe 2006). Hypertensive disease of pregnancy has been reported to be responsible for 20% antepartum and intrapartum stillbirth (Bhutta, 2011). A study from Ife, Nigeria reported a perinatal mortality rate of 5.84 per 1000 births attributable to severe pre-eclampsia/eclampsia (Makinde, 2009). It is therefore glaring that from a single disease entity, hypertensive diseases in pregnancy, such figures as quoted above for maternal and perinatal mortality are intolerably and unacceptably high in our environment. This makes it very important to put all measures in place to detect and institute early treatment of this condition to prevent morbidity and mortality in the mother and her baby.

Conclusion

Severe preeclampsia and eclampsia is still a major problem in the developing countries. Although hypertensive diseases in pregnancy are not predictable, they are however treatable if diagnosed early, preventing complications and death of the mother, the baby or both. It is therefore imperative to detect and manage hypertensive disease in pregnancy promptly and effectively as part of our antenatal care. However, this would be possible only if the affected pregnant women access early care in a standard healthcare facility. Thus community mobilization and education strategies for promotion of appropriate health-care-seeking-behavior by women should be evolved while also strategies to fight poverty among the population should be ensured.

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