

Pharmacological Intervention of Pre-Eclampsia and Eclampsia: A case study of a tertiary health institution in Jos, Nigeria

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Blood pressure is an important parameter in monitoring pregnancy. Pre-eclampsia and eclampsia are major causes of poor gestational outcome in tropical Africa. This research was carried out to ascertain if the management of pre-eclampsia and eclampsia in Nigeria is in line with global recent advances. A retrospective data collection and evaluation protocol was used. Eighty-eight patient files (sixty-two with eclampsia and twenty-six with pre-eclampsia) presented over a period of four years (Jan 2004- Dec 2007). Parity, age, stage of pregnancy, occupation, blood pressure range (before and after pharmacological intervention) and drugs used in managing both conditions were evaluated. The highest incidence occurred in first pregnancies, young maternal age, third trimester and full-time house wives. Blood pressures were observed to decrease with drug use and after delivery of the fetus and placenta. The study was in line with global recent advances. It revealed the need for closer evaluation of pharmacological intervention for eclampsia and pre-eclampsia to ensure better fetal and maternal health outcomes as stated in the 4th and 5th Millennium Development Goals.

Keywords: Pre-Eclampsia, Eclampsia, Blood Pressure

INTRODUCTION

Pre-eclampsia is a disease process by which a placental lesion such as hypoxia allows increased fetal material into circulation that leads to an inflammatory response and endothelial damage ultimately resulting in pre-eclampsia and eclampsia (1). Pre-eclampsia is a disorder associated with pregnancy that consists of hypertension and proteinuria which manifests most after the 20th week of pregnancy and majority of the cases occur in the third trimester (2). Proteinuria occurs when protein is greater than 300mg/dl during a 24-hour period (3).

Eclampsia, a greek word meaning 'bolt from the blue' describes one or more convulsions occurring during or immediately after pregnancy as a complication of pre-eclampsia (4). Eclampsia had been recognized since ancient times but it wasn't until the mid nineteenth century that doctors began to realize that the fits were normally preceded by collection of circulatory disturbances now known as pre-eclampsia (5).

The hypertension component of the disease occurs when systolic and diastolic blood pressure is above 140 and 90 mmHg respectively in a woman known to be normotensive prior to pregnancy (3). Diagnosis requires two such abnormal blood pressure measurements recorded at least six hours apart. High blood pressure (hypertension) is the most common medical problem encountered in pregnancy (6).

Pre-eclampsia can be classified as mild or severe. Its etiology is unknown. However, several theories proposed in an attempt to explain the pathophysiology of pre-eclampsia include; increase in the number of active circulatory mediators such as angiotensin II during pregnancy, improper placental development resulting in vascular endothelial dysfunction and relative uteroplacental insufficiency, increased cardiac output and a newer research suggesting primiparity playing a larger role than primigravity (7).

Other possible causes of pre-eclampsia include; placental defect, increased placental tissue, chromosomal abnormality such as trisomy, insufficient blood vessels, poor diet (8). Factors involved in the development of eclamptic seizures include; reduced blood flow to the brain, cerebral edema probably due to excessive fluid retention, bleeding from small arteries ruptured by intensity of the blood pressure, ischaemia and thrombus. Mild pre-eclampsia affects up to 10% of first time pregnancy with severe pre-eclampsia affecting about one or two in a hundred pregnancies. In essence, pre-eclampsia is more common in women who are pregnant for the first time (6,9).

Signs of pre-eclampsia are hypertension and proteinuria after 20 weeks of pregnancy. However, others include severe headache, dizziness, nausea and vomiting, visual disturbances, edema particularly in the face, hands and legs, hepatocellular necrosis. Eclamptic convulsions look no different from epileptic fits (10).

Pre-eclampsia is more common on women who have pre-existing hypertension, diabetes, renal disease, age (above 35), existing family history and multiple gestation. The most significant risk is having had pre-eclampsia in a previous pregnancy. Other risk factors include; four times the relative risk being the daughter or sister of a woman who has had pre-eclampsia (5), three times the relative risk in older than younger maternal age, maternal vitamin D deficiency, twin pregnancy with a new partner, black race (5). In a 2006 study, pregnant women who had high levels of two specific proteins in their blood were found to be more likely to develop pre-eclampsia than were other women. These proteins interfere with the growth and function of blood vessels- lending evidence to the theory that pre-eclampsia is caused by abnormalities in the blood vessels feeding the placenta (11).

As a preventive measure in the US, magnesium is routinely given to women with pre-eclampsia in expectation that it

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prevents progression to eclampsia. However, this is not currently a standard practice in the UK (12).

In the management and treatment, a lot of factors come to play. They include; medical care- delivery of the fetus where the mother’s health is at significant risk (2). surgical caesarean delivery (2); pharmacological intervention- use of drugs which focus on treatment of hypertension and prophylaxis against seizures such as hydralazine, which is the antihypertensive agent most often used in pregnancy (13). Recent studies have shown that intravenous labetalol and oral nifedipine may be as effective and have fewer adverse effects than intravenous hydralazine. Notably, ACE inhibitors are contraindicated in pregnancy because of their teratogenic effect (4). Magnesium sulphate which is the first-line therapy for seizures because it prevents vascular seizures¹². The prevention of vasospasm in the brain is believed to protect against seizures (11). Other drugs include; alpha methyl dopa, diazepam (for seizures resistant to magnesium sulphate) (14). It is important to note that pre-eclampsia occurs less frequently in couples who practice oral sex and even rarer in couples where fallatio ended with the semen swallowed. This is consistent with other evidence that semen contains an agent that prevents pre-eclampsia (15).

The aim of this study was to assess the outcome of treatment of pre-eclampsia, to find out if the management strategies have been effective and to ascertain if they are in line with recent advances in pre-eclampsia and eclampsia management.

MATERIALS AND METHODS

The study was conducted in Plateau State Specialist Hospital, Jos-Nigeria. Ethical clearance was obtained from the ethical committee of the hospital, granting access to the files.

Eighty-eight files (twenty six pre-eclamptic and sixty-two eclamptic) were studied in retrospect of patients admitted in the hospital from January 2004 to December 2007. Data collected were entered into the Statistical Package for Social Sciences (SPSS) version 16 and descriptive statistics were generated.

RESULTS AND DISCUSSION

The high incidence of 30.8% and 35% as seen in table 1 of pre-eclamptic and eclamptic patients respectively was in women of young maternal age (15-20 years) which is in agreement with results of previous studies (16,17). This could be as a result of under developed reproductive organs.

The distribution of patients according to number of pregnancies (parity) seen in table 1 showed a high occurrence in first pregnancies with 31% and 45% for pre-eclamptic and eclamptic patients respectively. This corresponded with previous findings (6, 9), which showed that mild pre-eclampsia affects up to 10% of first time pregnancies. A prevalence of 7.7% and 6.5% of pre-eclampsia and eclampsia respectively in twin pregnancies as similarly reported, which stated that women with increased placental tissue for gestational age such as in twin pregnancies have an increased prevalence of pre-eclampsia and eclampsia (5).

The results also revealed a high incidence in third trimester with 81% and 73% for pre-eclampsia and eclampsia

respectively in agreement with previous findings, which showed that pre-eclampsia and eclampsia manifest most often after 20 weeks of pregnancy and the majority of cases occur in the third trimester (2).

The occupation distribution showed the highest incidence; 69% and 76% of housewives presenting with pre-eclampsia and eclampsia respectively. This could be explained from two dimensions: The housewives not exercising their bodies enough to encourage free blood circulation. Secondly, it could be as a result of stress placed on full time housewives in caring for the family and home which may lead to hypertension-especially during pregnancy.

Table 1: Demographic distribution of patients

Variable	Eclampsia n (%)	Pre-eclampsia n (%)
Age Group (Years)		
15-20	22 (35)	8 (30.8)
21-25	18 (31)	2 (7.7)
26-30	4 (7)	8 (30.8)
31-35	8 (12)	6 (23)
36-40	8 (12)	-
41-45	2 (3)	2 (7.7)
Occupation		
Housewives	47 (76)	18 (69)
Civil servants	4 (6)	5 (19)
Business women	9 (15)	3 (12)
Students	2 (3)	-
Number of Pregnancy		
First	28 (45)	8 (31)
Second	10 (16)	5 (19)
Third	5 (8)	3 (12)
Fourth	-	4 (15)
Fifth	9 (15)	4 (15)
Sixth and above	10 (16)	2 (8)
Stage of Pregnancy		
First	-	-
Second	2 (3)	4 (15)
Third	45 (73)	21 (81)
Postpartum	15 (24)	1 (4)

Table 2 showed the distribution of patients according to the range of systolic and diastolic blood pressure at the time of admission. It was observed that most of the patients presented with systolic blood pressure greater than 140mmHg and all the patients presented with diastolic blood pressure greater than 90mmHg. This is in agreement with previous findings, which showed that the hypertension component of the disease is present when blood pressure is greater than 140/90mmHg in a woman known to be normotensive in pregnancy (3).

Table 2: Blood pressure range before pharmacological intervention

Variable	Eclampsia n (%)	Pre-eclampsia n (%)
Systolic (mmHg)		
200-260	25 (40)	10 (38)
130-190	37 (60)	16 (62)
Diastolic (mmHg)		
100-120	38 (61)	18 (69)
130-150	15 (24)	7 (27)
160 & above	9 (15)	1 (4)

Significant decrease in systolic and diastolic blood pressure to below 140 and 90 mmHg respectively was observed after pharmacological intervention as seen in table 3. Bed rest was recommended for all the patients as previously stated that pre-eclamptic and eclamptic patients have traditionally been admitted and placed on bed rest for the duration of pregnancy (18).

Six of the pre-eclamptic patients defaulted from bed rest and medication and all six developed eclampsia out of which two died. Overall, six eclamptic patients died.

Table 3: Range of blood pressure after pharmacological intervention

Variable	Eclampsia n (%)	Pre-eclampsia n (%)
Systolic (mmHg)		
100-130	45 (72)	21 (81)
140-160	13 (21)	3 (11)
Diastolic (mmHg)		
50-80	38 (61)	13 (50)
90-120	20 (32)	11 (42)

The drug distribution in table 4 showed a high percentage of pre-eclamptic and eclamptic patients on diazepam, hydralazine, alpha methyl dopa, nifedipine and magnesium sulphate. This is in line with recent advances in management of pre-eclampsia. In addition, it was observed that magnesium sulphate was the least drug used probably due to its low availability in the hospital. It was also observed that most patients with ante-partum pre-eclampsia and eclampsia were ultimately treated by emergency caesarean section or by induction of labor in agreement with findings that definite treatment of pre-eclampsia and eclampsia is delivery of the fetus and placenta (2).

Table 4: Distribution of drugs used for the treatment of eclampsia and pre-eclampsia

Drugs	Eclampsia n (%)	Pre-eclampsia n (%)
Diazepam	58 (94)	4 (15)
Hydralazine	49 (79)	21 (81)
Alphamethyl dopa	38 (61)	17 (65)
Nifedipine	43 (69)	16 (62)
Magnesium sulphate	27 (44)	11 (42)

CONCLUSION

This study showed that although the definite treatment of pre-eclampsia and eclampsia is delivery of the placenta, they can be pharmacologically managed effectively with drugs. Hence, the management of pre-eclampsia and eclampsia in the studied hospital is in line with global recent advances. The study has also shown the need for closer evaluation of pharmacological intervention for eclampsia and pre-eclampsia to ensure good fetal as well as maternal outcomes.

This will involve monitoring on the part of care providers at clinics and the provision of proper pharmaceutical care.

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