# Ecalmpsia: maternal and fetal outcome

*Tukur A Jido

Department of Obstetrics and Gynaecology, Bayero University/Aminu Kano Teaching Hospital, PMB 3452, Zaria road, Kano, Kano State, Nigeria

## Abstract

**Objective:** To determine the incidence of eclampsia and examine the maternal and fetal outcome.

**Methods:** A hundred and twenty consecutive admissions with eclampsia managed in Aminu Kano Teaching Hospital, Kano, Nigeria, were prospectively collated and analysed. Maternal and fetal morbidity and mortality were recorded.

**Results:** The incidence of eclampsia was 1.2% of deliveries. Most (69.2%) of the patients had no antenatal care. In 93 (77.5%), the convulsions were controlled with diazepam, and 22.5% magnesium sulphate. Maternal complications rate was 39.2%, and use of Diazepam for control of convulsions increases complications (RR 3.12, 95% CI = 1.23-7.92, p= 0.02). Case fatality rate was 11.7%, diazepam use failed to achieve significant association with maternal death (RR 8.64, 95% CI = 0.53-140.29, p= 0.13). Stillbirth rate was 22.5% with significant association with diazepam use (RR 7.55, 95% CI= 1.07-53.09, p=0.04). Birth asphyxia was recorded in 39.1% and low birth weight in 25.8%.

**Conclusion:** The incidence of eclampsia in our hospital was very high, with corresponding high maternal and perinatal morbidity and mortality. Increased antenatal screening and use of magnesium sulphate to control convulsions will reduce the incidence and associated morbidity and mortality for both mother and fetus.

**Keywords:** eclampsia, outcome, Kano, Nigeria

*African Health Sciences* 2012; 12(2): 148 - 152 http://dx.doi.org/10.4314/ahs.v12i2.11

## Introduction

Most of the over half a million maternal deaths that occur annually are in developing countries like Nigeria[1]. Worldwide eclampsia and preeclampsia account for about 63 000 maternal deaths annually[2]. In developing countries case fatality rate of up to 14% is reported in relation to eclampsia compared to 0% to 1.8% in developed countries[3]. In Northern Nigeria reports from different parts have sited eclampsia as the leading cause of maternal mortality[4,5]. This is variously attributed to cultural practices leading to early child bearing in the wake of poor maternity care services that are grossly underutilised. In a recent report from Maiduguri North eastern Nigeria, eclampsia accounted for 46.4% of all maternal death[5].

Similarly the incidence of the disease remained very high. In Gwagwalada, northern Nigeria the incidence is 1.3%[6] of all deliveries and similar rates are reported across other parts of the country[7]. There is evidence that the incidence and related mortality to this disease are similar in Africa, Asia and the Carribean. In the USA, the incidence and mortality from eclampsia is two times higher in African Americans than in whites. This is attributed to inadequate access to antenatal care and genetic factors associated with increased circulating antiphospholipids among the black population. In developed countries, much lower incidences have been achieved through aggressive screening and management of preeclampsia. In the Netherlands, the incidence of eclampsia is 6.2 per 10 000 births[8]

Preeclampsia and eclampsia are major causes of maternal and perinatal morbidity and mortality. Transient neurological deficit is common but persistent deficits are rare[3]. Renal failure complicating eclampsia may result in prolonged renal insufficiency. Eclampsia accounted for 67.2% of obstetrics causes of acute renal failure requiring dialysis[9]. Hepatic dysfunction is a result of associated liver parenchymal damage, periportal necrosis and rarely, hepatic rupture[3]. Preeclampsia has been shown to be associated with diastolic dysfunction, increase cardiac work, and left ventricular indices with evidence of myocardial damage. Cerebrovascular accidents are common; in the long term cardiac and metabolic disease risks are increased[10].

In the fetus preterm delivery, asphyxia and intrauterine growth restrictions commonly associated with the disease increase the perinatal mortality[2,6]. Pregnancy related complications like abruptio placentae, HELLP syndrome are frequent

***Correspondence author:**
Dr Tukur A Jido
Department of Obstetrics and Gynaecology
Aminu Kano Teaching Hospital
PMB 3452, Zaria road
Kano State, Nigeria
Email: Tukur.jido@nhs.net, tukurjido@yahoo.com

associations and pose a risk to both mother and fetus. Pre-eclampsia and eclampsia are independent risk factors for cerebral palsy[11]. Perinatal mortality is increased and neonatal intensive care admission is common. Perinatal mortality rates of up to 19.1% are reported from centres in Nigeria in association with eclampsia[12].

In this study we analysed consecutive cases of eclampsia to determine the maternal and fetal outcomes and discuss ways to improve them. Outcomes were compared against the anticonvulsant used to control the eclamptic seizures.

## Methods

This is a descriptive study of patients admitted with eclampsia and managed in the maternity unit of Aminu Kano Teaching Hospital, Kano state, Nigeria. Eclampsia was diagnosed when convulsions occur in association with syndrome of preeclampsia in the second half of pregnancy and the puerperium in patients without known history of convulsion, meningitis, or head injury. Preeclampsia was defined based on the criteria recommended by Davey and Macgillivray 1988[13]. All patients were screened for malaria on admission using peripheral blood film to exclude cerebral malaria. Patients with clinical diagnosis of cerebral malaria and other medical causes of convulsion and coma were excluded. These included two patients with cerebral malaria and one with meningitis.

Data were prospectively collected and information recorded includes obstetrics characteristics, gestational age, mode of delivery, intensive care unit admission, time of eclampsia in relation to labour and maternal and fetal complications. All patients were followed up from admission with eclamptic convulsions through to discharge, for the duration of their hospital stay. Data were analysed using descriptive statistics. The relative risk of maternal death, morbidity, and stillbirth were compared between patients whose convulsions were controlled using diazepam and magnesium sulphate. The corresponding p values at 5% level of significance were computed.

## Results

A hundred and twenty consecutive cases of eclampsia were recorded out of 10 163 deliveries, giving an incidence of 1.2%. Thirteen (10.8%) of the cases had antenatal care in our hospital, while 83(69.2%) gave no account of antenatal care in this pregnancy. The remaining 24 (20%) patients gave history of antenatal care elsewhere but no details were available to determine what happened during the antenatal period.

The mean age of the patients was 21.5+/-5.48 years. Seven, (5.8%) were 35 or more years and 69 (57.5%) were teenagers. Majority (55%) were nulliparous, while 3.3% are of parity 5 and above. Eighty-nine (74.2%), had seizures before or during labour while 25.8% had postpartum eclampsia.

Convulsions were controlled with diazepam in 93 (77.5%) patients while the remaining 22.5% had magnesium sulphate. Sixty seven (55.8%) patients were delivered by caesarean section, and 18 (15%) had assisted vaginal delivery. The rest had normal vaginal delivery.

Table 1 shows the maternal outcome. Fourty seven (39.2%) had complications. Relative risk of complication for diazepam as anticonvulsant is 3.12 (95% CI = 1.23-7.92, p= 0.02). Thirteen (10.8) patients had prolonged unconsciousness up to 7 days. Of these 3 had residual neurological deficit (quadriplegia in 1 and hemiplegia in 2 patients). Two patients had pulmonary oedema and 4 had aspiration pneumonia. Six patients had acute renal failure but only one required dialysis. Five (4.2%) had HELLP syndrome and two patients with obstructed labour had vesicovaginal fistula. Another patient had cardiomegaly incidentally diagnosed on x ray; she had no cardiovascular symptoms. There were 14 maternal deaths giving a case fatality rate of 11.7%. There was no mortality in the 27(22.5%) patients treated with magnesium sulphate compared to diazepam (RR 8.64, 95% CI = 0.53-140.29, p= 0.13). The leading causes of death were cerebrovascular accident and pulmonary oedema. Consent for autopsy was declined by all the relatives of the patients that died in keeping with the local customs of the people. The attributions to the cause of death were based on the main clinical diagnosis prior to the death of the patient.

**Table 1: Maternal complications of gestations complicated by eclampsia**

| Complication | Number (%) |
|---|---|
| Prolonged unconsciousness | 13 (10.8) |
| Acute renal failure | 6 (5.0) |
| Cerebrovascular accident | 5 (4.2) |
| HELLP Syndrome | 5 (4.2) |
| Pulmonary oedema/pneumonia | 6 (5.0) |
| Coagulopathy | 4 (3.4) |
| Abruptio placenta | 3 (2.5) |
| Cortical blindness | 2 (1.7) |
| Cardiomegally | 1 (0.8) |
| Vesicovaginal fistula | 2 (1.7) |
| Death | 14 (11.7) |

The perinatal outcome is shown in table 2. The stillbirth rate was 22.5%. The relative risk of stillbirth for diazepam was 7.55 (95% CI= 1.07-53.09, p=0.04). The data on early neonatal death was incomplete because of difficulty with follow up. Thirty one (25.8%) babies had birth weight less than 2500g; 9 (7.5%) of them were preterm. Fourty seven (39.1%) had low Apgar scores at 5 minutes and 17(14.2%) were admitted to the special care baby unit, mostly for asphyxia and prematurity.

**Table 2: Perinatal outcome for gestations complicated by eclampsia**

| Outcome | Number (%) |
|---|---|
| Stillbirth | 27 (22.5) |
| Birth asphyxia | 47 (39.1) |
| Low birth weight | 31(25.8) |
| Admission to nursery | 19 (15.0) |

## Discussion

The incidence of eclampsia in our unit was 1.2% of deliveries. Onuh in Benin, Nigeria reported 1.32%[7]and Okafor recently reported an incidence of 0.82% in Abuja, Nigeria [14]. A high incidence of eclampsia is common in developing countries where most patients have no antenatal care which would allow for early recognition and treatment of pre-eclampsia. Most of our patients did not receive antenatal care; previous reports from this country have identified the paucity of quality antenatal care among eclamptic patients[12, 14]. Efforts at mitigating identified barriers to antenatal care attendance have been shown to improve uptake of antenatal and maternity care, with positive impact on morbidity and mortality, including eclampsia.

The pattern of presentation in our patients, further reflect the paucity of an effective screening and treatment of precursor preeclampsia. The majority of the patients are young and nulliparous; antepartum and intrapartum eclampsia accounted for 74.2% of the cases. In developed countries with improved recognition and treatment of pre-eclampsia postpartum eclampsia is more common[8]. Most eclamptic seizures occur in the 3rd trimester: - 90% after 28 weeks and 80% are intrapartum or postpartum.

Complications were recorded in 39.2% of the patients, with a case fatality rate of 11.7%. Similar figures are reported from elsewhere in developing countries[15]. The case fatality rate in the United Kingdom is 1.8%. Prolonged unconsciousness and intensive care unit admission that are recorded here may be partly due to the use of diazepam for the control of convulsions in 77.5% of the patients and in part repeated convulsions that characterise our patients whose first convulsions are usually outside the hospital. The use of diazepam was associated with increased morbidity (RR 3.12, 95% CI 1.23-7.92, p= 0.02) but not maternal death in this study (RR 8.64, 95% CI 0.53-140.29, p= 0.13). When compared to magnesium sulphate, diazepam is associated with an increased risk ratio for maternal death, repeat convulsions and complications[16]. The failure of association of diazepam with maternal death in our series is very likely due to small sample size.

The overall complication rate among patients with eclampsia and HELLP syndrome admitted to the intensive care unit was 14% in a Spanish report. Renal failure was seen among 5% of our patients; similar to the 5% of the patients in Spain[17]. In another report eclampsia and pre-eclampsia accounted for 67.2% of obstetrics patients requiring dialysis[9]. Five (4.2%) patients had cerebrovascular accident and 2 (1.7%), had transient cortical blindness. Transient neurological deficit including cortical blindness may affect up to 56% of patients with eclampsia[3]. Cerebrovascular accident (CVA) is a common cause of death in eclampsia[18]. In this study, 4.2% of the patients had clinical evidence of CVA with 50% mortality. It is believed to be the consequence of very high blood pressure both systolic and diastolic. Until recently, our policy for antihypertensive treatment in patients with preeclampsia/eclampsia was almost exclusively based on diastolic blood pressure. Recent evidence suggests that systolic hypertension on its own is as important in causing CVA as diastolic and warrants treatment on its own merit[19]. The high rate of CVA here was partly a reflection of the previous approach to systolic hypertension on one hand and late presentation among our patients that often arrive after repeated convulsions with no initial treatment to control seizures or the blood pressure.

Pulmonary oedema and aspiration pneumonia are also associated with a high rate of maternal death and are indications for intensive care monitoring. Six (5%) patients had this complications of which 4 were among the cases that died. A report of an international study group suggested that serious complications including mortality among patients with eclampsia can be predicted through disease modelling with signs and symptoms that include age,

chest pain, or dyspnoea, among other things[20]. Although none of our patients had an autopsy and all attributed causes of death were clinically determined, we considered respiratory signs and symptoms to carry poor prognosis in these patients. Early recognition and strict monitoring in liaison with a senior anaesthetist is advocated to limit mortality from this complication.

Coagulopathy complicated 3.4% of the cases. This is higher than 2% in other reports[16] and like Efetie and Okafor[12] 4.2% of our patients had HELLP syndrome. This poses a challenge in the care of eclamptic patients in our setting, owing to the dearth of blood products required to correct them. Nevertheless, their correct identification is important in preventing further bleeding related morbidity during surgery or following trauma of delivery. One patient with incidental finding of cardiomegaly and no cardiac symptoms was identified following a chest x ray for presumed chest infection. Recent evidence suggests that persistence of left ventricular dysfunction/hypertrophy is noted in preeclampsia which may point to long term cardiovascular risk[9].

Three (2.5%) of our patients had placental abruption. This is a common cause of renal failure, postpartum haemorrhage and perinatal death. The stillbirth rate was 21.7%, and all 3 patients with abruption had stillbirth. Hypertensive disorders are a common cause of preterm labour, perinatal death and intrauterine growth restriction[21]. Thirty five patients, (25.4%) had low birth weight and 7.5% were delivered preterm. Asphyxia (low Apgar scores at 5 minutes of age) was recorded in 39.1% of the neonates. Although hypertensive disorders are thought to confer some protection to respiratory distress syndrome, repeated convulsions at home before reaching the hospital and anticonvulsant therapy with diazepam are very likely contributors to fetal depression and low Apgar scores at birth. This may be a factor in the relatively high rate of admission to the special care baby unit in this report. We have since switched to magnesium sulphate for control of convulsions in this unit.

The modest sample size in this study and lack of autopsy limit the ability to critically appraise the direct causes and associated factors for maternal death. Furthermore, the lack of follow up after hospital discharge for the patients means that the data on early neonatal morbidity and mortality as well as maternal outcome for the rest of the puerperium was not available for analysis.

## Conclusion

The incidence of eclampsia remained high in our unit and attending maternal and perinatal morbidity and mortality are increased. These can be reduced by more careful blood pressure control, and developing strategies that increase the use of maternity care services for both antenatal care and delivery to avail patients the benefits of screening and well established interventions. The impact of recently introduced magnesium sulphate on morbidity and mortality in the unit will be assessed in the future.

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