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Atypical Eclampsia at a Regional Hospital in Northern Kwa Zulu-Natal: Lessons to Learn

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Abstract

Background: Recent publications indicate that eclampsia (convulsions associated with hypertension and proteinuria in pregnancy) may occur without the classical clinical signs of hypertension and proteinuria. Such cases labelled atypical eclampsia can occur for the first time antenatal, intrapartum or 48 hours after but within four weeks of childbirth in the absence of hypertension and proteinuria. Raising awareness of atypical eclampsia may improve the clinical management including appropriate investigations.

Objectives: To describe the prevalence and maternal and perinatal outcome of atypical eclampsia in a rural northern KwaZulu-Natal Province.

Methods: This was a chart review of cases diagnosed as eclampsia admitted to a regional hospital serving 19 maternity clinics and 17 district hospitals in northern Kwa Zulu-Natal over a 2 year period (2016-2017). The details of those cases considered be atypical were analysed.

Results: There were 168 cases of eclampsia; seven cases had atypical eclampsia giving an incidence of 4.2%. Convulsions occurred antenatal in four cases (57.1%); intrapartum in two (28.6%) and postpartum in one case (14.3%). Six (85.7%) were referred from district hospitals, and all six received antenatal care; the seventh case had antenatal care at a clinic. The mean age was 20.4 years (range: 16-29); 42.9% were 16-19 years old. Four (57.1%) were primigravida and there was one maternal death. Surprisingly there was no evidence of neurological imaging studies.

Conclusion: This study confirms that atypical eclampsia is an uncommon finding at the study site. Of concern is the lack of imaging studies to exclude neurological causes of the convulsions.

Keywords: Eclampsia atypical; Eclampsia convulsions

Introduction

Eclampsia is a poorly understood neurological complication of pregnancy that substantially contributes to high rates of maternal and perinatal morbidity and mortality, globally [1-3]. The classical clinical presentation of eclampsia consists of epileptic convulsions or coma associated with hypertension and proteinuria occurring after the 20th week of pregnancy, intrapartum and within 48 hours of delivery [1-3]. In the majority of cases, eclampsia is preceded by symptoms and signs of preeclampsia and the diagnosis require the exclusion of medical and neurological disorders if the diagnosis is doubtful [1-3].

Eclampsia is a relatively uncommon event in high-income countries but occurs in 1%-3% of all pregnancies in Low- and Middle-Income Countries (LMIC) [4]. Most cases of eclampsia in LMIC are associated with no or poor-quality antenatal care, severe high blood pressure and proteinuria [4]. However, recently there have been several case reports and reviews of pregnant women without a history of epilepsy or preceding hypertension and proteinuria who present with sudden onset of convulsions for the first time usually in the antepartum or in the postpartum period (>48 hours after delivery) [5-7]. Such cases present inexperienced clinicians with a dilemma as to whether to make a diagnosis of eclampsia and treat as such or to manage these cases as idiopathic convulsions in pregnancy or gestational epilepsy [5-7]. Several authors have labelled such clinical scenarios as atypical eclampsia or eclampsia without pre-eclampsia [5-7].

Although there is no strict definition of atypical eclampsia, convulsions not proceeded by hypertension and/or proteinuria, occurring before 20 weeks of gestation, during the ante and intrapartum periods, and/or after 48 hrs post-delivery are termed atypical eclampsia [5-6]. Unfamiliarity with atypical eclampsia results in a delay in both diagnosis and initiation of appropriate investigations.

There is limited data on the incidence of atypical eclampsia in South Africa, except for a 'brief report' in 2005, which noted the frequency of atypical eclampsia to be 8% over a 2 year study period [5]. Another

report comparing maternal and perinatal outcomes in typical *vs* atypical eclampsia found that maternal outcomes did not differ between the two groups [7]. Considering that eclampsia accounts for >50% of deaths associated with hypertensive disorders of pregnancy, particularly in South Africa, there is a need to bring to the attention of all health care professionals the possibility of atypical eclampsia and the potential need for investigations such as neuroimaging [2,3]. Patil et al. found significant cerebral pathology in cases of atypical eclampsia causing significant neurological morbidity [8]. Thus, the aim of this study was to investigate the incidence and clinical features of atypical eclampsia in a regional hospital in Northern Kwa Zulu-Natal Province, South Africa.

Methods

Regulatory permissions (institutional ethical, provincial health authority and health facility BREC -BE010/18) were obtained prior to commencement of the study. The study was a retrospective chart review. Purposive sampling was used and the hospital records of all patients who had a final diagnosis of eclampsia in the labour suite registration book (birth record book), in the high care and intensive care unit admission books, at a regional hospital were reviewed over a 2 year period. The hospital was a "stand alone" regional mother and child hospital and was a major referral centre for a number of district hospitals and 19 clinics providing maternal health care. All cases of eclampsia were managed in accordance with the South African maternity care guidelines [9].

The chart reviews were done by the principal author (SB) using a predesigned data tool to obtain detailed information, including antenatal care information, demographic data, clinical features, investigations and maternal and neonatal outcomes. Eclampsia was defined as convulsions or coma occurring in pregnancy associated with hypertension (BP > 140/90 mmHg in a previously normotensive patient) and at least one plus of proteinuria detected on urinary dipstick analysis.

Patients who had convulsions prior to 20 weeks gestational age or >48 hours after delivery or who had convulsions with blood pressure levels below 140/90 mmHg and no evidence of proteinuria on urinary dipstick testing formed the study group and were regarded as atypical eclampsia. Patients with missing patient information, or known neurological abnormalities were excluded from the study.

Statistics

The data was analysed using the SPSS version 25 (Statistical Packages for the Social Sciences). A descriptive statistical analysis of the data (means, standard deviations, ranges, frequencies and percentages) are presented.

Results

During the 2 year period, 168 patients were diagnosed with eclampsia; seven cases were identified as atypical eclampsia. The timing of the convulsions in the seven cases was antenatal in four (n=4:57.1%); intrapartum in two (28.6%) and postpartum in one (14.3%). Six (85.7%) cases of atypical eclampsia were referred from district hospitals, and all six had initiated antenatal care. The seventh case was referred from a community clinic. There were 168 cases of eclampsia in total; four cases had slightly blood pressure levels of 120-139 systolic and or 80-90 mmHg diastolic or isolated proteinurias during antenatal visits which were not regarded as significant by the health care professionals. All four of these cases were primigravidae and presented with convulsions and slightly elevated blood pressures within two weeks of their last antenatal visit and were therefore not regarded as having had atypical eclampsia but eclampsia by the authors of this article (Figure 1).

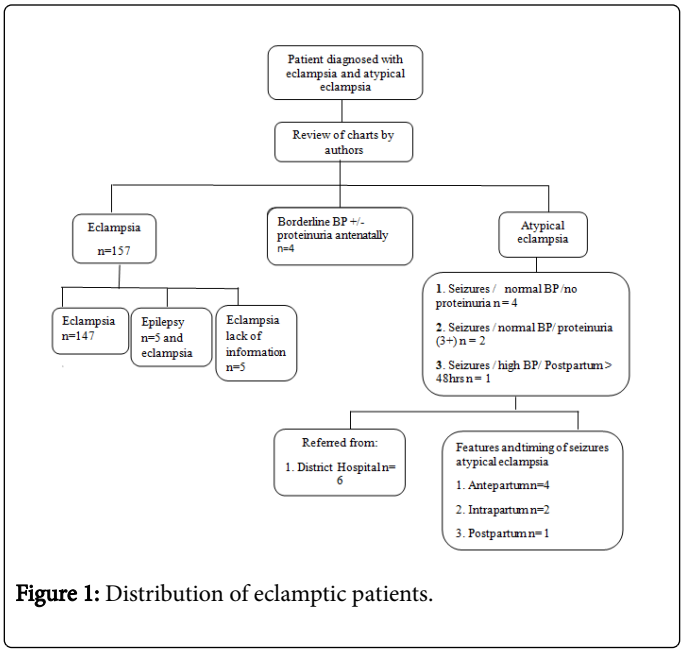

Figure 1: Distribution of eclamptic patients.

The demographic and clinical data are shown in Table 1. The mean age was 20.4 years (range: 16-29) and 42.9% were between age of 16-19 years. The median parity was 0 (range: 0-3); four (57.1%) of the patients were primigravidae.

Variable	Mean and range
Age (years)	19 (16-19)
Age groups	
16-19	3 (42.9%)
20-24	2 (28.6%)
25-29	2 (28.6%)

Parity	0 (0-3)
0	4 (57.1%)
1	2 (28.6%)
3	1(14.3%)
HIV status	
Positive	3 (42.9%)
Negative	4 (57.1%)
Anaesthesia	
Spinal	4 (57.1%)
General	3 (42.9%)
Mode of delivery	
Caesarean delivery	6 (85.7%)
Hysterotomy	1 (14.3%)
Fetal outcome	
Alive	6 (85.7%)
Stillbirths	1 (14.3%)

Table 1: Demographic and clinical characteristics of patients with atypical eclampsia (n=7).

There were avoidable factors in the management of atypical eclampsia; patient related factors included the use of herbal medication (n=1), late booking for antenatal care (n=2) and missed antenatal care visits (n=1); health care professional related factors included patient inadequately managed at the referral centre (n=1) and administrative problems related to transport delay) (n=1).

There was one maternal death. The patient a 24 year P1 G 2, had had 2 previous antenatal visits prior to her admission for eclampsia. Blood pressure levels at both antenatal visits were within normal limits. The patient had Blood Pressure (BP) levels between 131/70 and 128/98 mmHg on admission but was semi-conscious; her family gave a history that the patient had convulsions prior to her admission, but there was no history of epilepsy. Laboratory findings were unremarkable (haemoglobin 12.3 mg/dL, platelets 284x109, creatinine 44 mg/dl, normal liver enzymes and a trace of proteinuria. The patient was 26 weeks pregnant; an intravenous magnesium sulphate regimen was prescribed but anti-hypertensive medications were not prescribed because the blood pressure levels were below 140/90 mmHg. Following "stabilization" she delivered a healthy female baby by caesarean section under spinal anaesthesia, the baby had Apgar scores of 9 and 10 at 1 min and 5 minutes respectively, and had a birth weight of 800 g. The post-partum period was uneventful until day three post-delivery, when she developed recurrent seizures, despite being normotensive. The magnesium sulphate regimen had been stopped 24 hours after the caesarean delivery. Therefore, the MgSO4 IV regimen was re-started following the first seizure. The patient however dropped her Glasgow Coma Scale after a third seizure and resuscitation was unsuccessful. The final cause of death was not established because the patient's family declined a post-mortem investigation.

Discussion

Key findings

The key findings were that the majority of seven patients with atypical eclampsia were between the ages of 16-19 years and that a substantial proportion was primigravidae (Table 1). Furthermore, convulsions occurred for the first time antepartum (n=4:57.1%); two (28.6%) intrapartum and one (30%) in the postpartum period and the overall incidence of atypical eclampsia in our study was 4.2%.

Interpretation of our findings

The incidence of atypical eclampsia of 4.2% in the current study is much lower than that reported by Adie and Moodley in 2005 who reported on this disorder in the same population group. This may have been due to varying definitions of atypical eclampsia and possible bias in assessment of the cases. An interesting finding in our study was that there was only one case of atypical eclampsia which occurred after 48 hours of delivery. This was unexpected because recent reports have indicated that post-partum eclampsia accounts for anywhere from 11% to 44% of all cases of eclampsia in high income countries due to earlier recognition and aggressive management of pre-eclampsia [6,9]. It is possible that in LMIC patients with post-partum eclampsia and eclampsia present to emergency and accident/casualty departments or to internal medicine departments and are not reported in obstetric journals.

In a report on the prevalence of eclampsia in Kwa Zulu-Natal Province in South Africa, Makhanya et al. found that of 56 cases of eclampsia, the majority had convulsions for first time in the antepartum period and only one had a convulsion in the postpartum

period [4]. The clinical practice at the study site was to refer all patients with the diagnosis of eclampsia back to the referring hospital, because of overcrowding. However, the authors believe that patients with atypical eclampsia at least should have their follow up visits the regional hospital so that medical and neurological investigations can be done if appropriate.

There was one maternal death in the current study associated with atypical eclampsia. The patient's case records do not show any evidence of detailed history taking even though she had atypical eclampsia and the patient had sudden onset of convulsions on the third day postpartum and demised. There are reports that severe persistent headache in young pregnant women is a "red flag" and such complaints warrant a detailed history, exclusion of medical and neurological investigations, and imaging of the brain strongly considered. Moodley et al. report that severe persistent headache in pregnancy may indicate underlying cerebral pathology [10]. It is quite possible this patient had an underlying cerebral lesion and a detailed history, investigation for medical disorders and imaging may have detected underlying pathology.

The importance of neuroimaging in atypical cases of eclampsia has been clearly documented by Patil et al. [8]. In addition, Sibai and Stella suggest that neuro-imaging should be considered if appropriate in cases of atypical eclampsia [6]. These latter authors also point out that preeclampsia-eclampsia syndrome can be ruled out by using angiogenic-antiangiogenic biomarkers, placental growth factors and soluble Flt-1. Given the above it is of concern that in none of the cases of atypical eclampsia was neuro-imaging considered or at least the case records do not reflect this. It might be debated that obtaining neuro-imaging studies may be difficult in rural areas in northern Kwa Zulu-Natal. It however should be recognized that women in LMIC only seek medical care when pregnant and often do not return for scheduled postpartum visits. Therefore, it is incumbent on health care professionals to take a detailed history, careful examination and investigations to rule out medical disorders and even obtain a brain scan on an elective basis if in doubt of the final diagnosis of atypical eclampsia.

Limitations

A limitation of the current study was the fact that it was retrospective with the drawbacks of poor documentation and missing information. Future studies may benefit by doing a prospective study, ensuring detailed examination and exclusion of medical and neurological pathology or obtaining expertise if necessary.

During the study a small group of patients (n=4) were identified, who had borderline BP's (130-139/80-89) with or without proteinuria in young patients during the antenatal period which was not recognized as risk factors. These patients presented with eclampsia within 10 days of their last antenatal visit. These are risk factors which must be brought to the attention of all health care professionals (nurses and doctors); such patients must be immediately referred, or advice obtained on further management.

Conclusion

This clinical audit on cases of atypical eclampsia identified the need to ensure that such cases have a detailed history on factors suggesting underlying pathology, careful examination and investigations to rule out medical disorders and neuro-imaging if necessary to exclude cerebral pathology. Nonetheless all patients with unexplained convulsions in pregnancy should be managed initially as eclampsia and investigated following delivery.

Conflict of Interest

The authors report no conflict of interest.

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