Profile of Children Admitted with Acute Seizures in a Secondary Health Facility in Akwa-Ibom State, Nigeria

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ABSTRACT

Acute seizure is a common indication for hospital admissions in children. It may be associated with significant morbidity and mortality. To determine the common aetiologies and outcome of acute seizures among children admitted into Paediatric Unit of General Hospital, Iquita, Oron in Akwa Ibom State, Nigeria. This was a hospital-based prospective study which was conducted over a period of two years from 1st August, 2018 to 31st July, 2020. Children aged 1month to 16 years with seizures presenting to the Paediatric Unit of the General hospital Iquita, Oron were consecutively recruited into the study. Data obtained included their demographics, clinical presentations, underlying diagnosis, duration of hospitalisation and outcome. Acute seizures occurred among 52 patients out of the 986 patients admitted over the period giving a prevalence rate of 5.27%. Forty out of 52 patients (76.9%) had malaria. Other illnesses associated with acute seizures included bacterial meningitis (n=3) and sepsis (n=3). About 31% had received herbal or plain water enema before presentation. Mortality rate was 11.5% with severe malaria and sepsis as the commonest causes of mortality. Acute seizures are relatively common among children living in a malaria endemic coastal city of Oron, Akwa Ibom State. The most common causes are potentially preventable. Though the outcome was good in the majority of patients, government should enforce available programmes for these preventable illnesses and mothers should be educated on home management of acute seizures.

Keywords: Acute seizures. Akwa Ibom, Children, Oron

INTRODUCTION

Acute seizure is a common neurological emergency in children. It is an important reason for admissions among children and the commonest neurological emergency encountered in developing countries.[1] Incidence of acute seizure is high among children below the age of 5years with decreasing frequency in older children.[1-6] In patients with fever, acute seizures could be as a result of febrile convulsion, acute symptomatic causes such as bacterial meningitis or an initial seizure in a child with seizure disorder.[7]

Geographical variations determine the aetiology of acute seizures. Worldwide, febrile seizures are the most common type of acute seizures in children.[1,3-5] In some least developed countries, symptomatic seizures are the commonest.[3,4] Studies conducted in Nepal reported neurocysticercosis and other central nervous system infections as the commonest aetiologies.[3,4] On the other hand, in developing and tropical countries such as Nigeria and Kenya, where malaria is endemic, febrile convulsion as a result of malaria was reported as the commonest cause.[1,6,8,9]

A previous study in Uyo, another town in Akwa Ibom State on status epilepticus among children admitted in a tertiary health facility reported increased mortality with late presentation and wrong home management.[10] This was despite the availability of specialised medical and health personnel to counsel caregivers on home management of acute seizures. This study sought to fill the knowledge gap on the causes, management and outcome of acute seizures among children treated in a secondary health facility in Akwa Ibom State.

MATERIALS AND METHOD

Oron is the capital city of Oron local government area, one of the 31 local government areas that makes up Akwa Ibom State. Oron is a coastal city and has an area of 70km^2 and a population of 156,461 according

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to 2006 census.[11] Most of the inhabitants are traders or fishermen (i.e. most of the men are fishermen while the women trade in sea food products). The population is mainly Oro-speaking though the Ibibios, Annangs, Igbos and Hausas are also residents.

The city has a secondary health facility which is located in the heart of the city. The hospital has a Medical Superintendent as an administrative head who reports directly to the Akwa Ibom State hospital management board. The city has several primary health centres as well as private health facilities.

The study was conducted in the Paediatric ward of the general hospital, Iquita-Oron. The Paediatric ward has a thirty bedded capacity. It has a room which serves as the emergency room furnished with a couch for resuscitation and consulting space for the medical personnel on duty. Emergency conditions from birth to 18years are seen in the emergency room and those older than one month are admitted into the Paediatric ward while those less than one month old are admitted into the nursery unit of the hospital. The entire Paediatric Department which comprises of the children's outpatient, children's emergency room, Paediatric ward and Nursery are run by two Consultant Paediatricians, one of whom is a permanent staff while the other is on contract. The Department also has a medical officer, 3 house-officers and 5 nurses who are supervised by the consultant paediatricians. The Paediatric Department serves as a referral unit for paediatric cases from the primary health facilities as well as from the private health facilities within the local government area and other surrounding local government areas. University of Uyo Teaching Hospital, on the other hand serves as a referral centre for paediatric conditions which for want of adequate facilities cannot be managed in this hospital.

The study period was two years from 1st August, 2018 to 31st July, 2020 and involved children between the ages of 1month and 16 years. A patient was regarded as having acute seizure if the patient presented with history of seizure during this particular illness for which she/he is brought to the hospital, or is actively convulsing or developed seizure while on admission in the Paediatric ward. This patient with acute seizure and within the age bracket for this study (1month to 16 years) was regarded to have met the inclusion criteria and so was recruited into the study. Any patient with history of seizures occurring at home and the attending Medical personnel was not convinced that what the caregiver demonstrated was actually seizure, such a patient was excluded from the study. At admission, detailed history and thorough physical examination were carried out after resuscitation of an actively convulsing patient. Laboratory investigations were requested depending on the initial diagnosis made. Information extracted included age, sex, main symptoms at presentation, duration of hospitalisation and outcome among others. Outcome of the illness was categorised as discharged home when the patient recovered fully and was sent home, left against medical advice when parents decide to sign some paper and leave with the patient either because patient had not shown any remarkable improvement or the caregivers wanted to seek alternative treatment, died while on admission when the patient was certified clinically dead by a qualified medical personnel or referred to a higher health facility. The extracted information were filled into a structured pro-forma developed for this study. Parental educational attainment and occupation were used to allot a social class to the patients using a scheme proposed by Oyedeji with social class I as the highest and V as the lowest.[12] The social classes were further merged as follows: Social classes I and II as upper class, social class III as middle and social classes IV and V as the lower class.

A child was diagnosed as having malaria if s/he had asexual forms of P. falciparum on the blood film. Malaria was treated with intravenous artesunate at 3mg/kg at 0,12,24,48 hours and then antimalaria treatment was completed with a full course of artemisinin lumenfantrine combination therapy. Bacterial meningitis was diagnosed clinically in patients who presented with

signs of meningeal irritation such as neck stiffness, positive Kernig's and Brudzinski signs supported by cerebro-spinal fluid biochemistry characteristic of bacterial meningitis. For infants with no features of meningism, presence of bulging anterior fontanelle, supported by cerebro-spinal fluid (CSF) biochemistry of elevated protein were used to make the diagnosis of bacterial meningitis. Sepsis was diagnosed based on presence of temperature dysregulation (core body temperature >38.5 or <36°C), respiratory rate dysregulation, with either tachycardia or bradycardia in the presence of neutrophilia, leucocytosis and toxic granulation of the neutrophils. There were no facilities for cerebro-spinal fluid and blood cultures. Patients with bacterial meningitis were treated with intravenous ceftriaxone 100mg/kg/day twice daily in combination with crystalline penicillin at 400,000iu/kg/day 6 hourly for 7 days. Ceftriaxone and gentamycin were administered for children with sepsis. For the diagnosis of febrile convulsion, this was entertained in children between the ages of six months and five years with fever associated with convulsion with normal cerebro-spinal fluid Chemistry.[13] The cause of the febrile convulsion was determined and appropriate treatment administered.

Ethical approval was obtained from the Ethical committee of the University of Uyo Teaching Hospital. Written informed consent was obtained from caregivers of the participants. Data was analysed using the Statistical Package for Social Sciences (SPSS) for window version 26. Frequency tables and percentages were used to present the results.

RESULTS

Nine hundred and eighty-six children were admitted in the Paediatrics ward during the study period. Acute seizures occurred in 52 patients giving a prevalence rate of 5.27%. Of the 52 participants with acute seizures, 32 were males and 20 were females with male to female ratio of 1.6:1. The majority (76.9%) of patients were 5years old and younger with 80.8% of the participants belonging to Oro tribe. Most of the mothers of the participants had formal education up to at least the primary school level and only 9 mothers did not have any formal education. All the participants were of the Christian faith. The majority (98.1%) of participants had fever as one of the presenting complaints with 49 of them presenting with generalised seizures and 3 with focal seizures. Table 1 shows the clinico-demographic characteristics of the study population.

Table 1: Clinico-demographic characteristics of the patients.

	n=52	%
Age(years)		
<1	4	7.7
1-5	36	69.2
6-10	10	19.2
11-16	2	3.9
Gender		
Male	32	61.5
Female	20	38.5
Tribe		
Oro	42	80.8
Ibibio	8	15.4
Yoruba	1	1.9
Igbo	1	1.9
Socio-economic Class		
Upper	3	5.8
Middle	20	38.4
Lower	29	55.8
Fever present		
Yes	51	98.1
No	1	1.9
Type of seizure		
Generalised	49	94.2
Focal	3	5.8

Regarding the causes of acute seizures, febrile convulsion was the commonest diagnosis in 23 of the 52 patients. Acute uncomplicated malaria was a major cause of febrile convulsion involving 20 out of the 23 patients while acute respiratory infection and gastroenteritis were responsible for 2 and 1 cases respectively. Other causes of acute seizures were cerebral malaria in 11 patients with bronchopneumonia as an

associated diagnosis in one of them, other forms of severe malaria in 9 patients of which five had associated severe anaemia, bacterial meningitis in 3, sepsis in 3 and status epilepticus 3. Herbal intoxication was an associated diagnosis in one of the patients with diagnosis of status epilepticus. The causes are illustrated in table 2.

Table 2: Causes of acute seizures in the patients

Diagnosis made	N=52	%
Febrile convulsion	23	44.2
Cerebral malaria	11	21.1
Bacterial meningitis	3	5.8
Sepsis	3	5.8
Severe malaria	9	17.3
Status epilepticus	3	5.8
Total	52	100

Table 3 demonstrates the different forms of pre-hospital treatment administered to the patients. Almost half of the patients were not administered any medication at home, 16 of the patients were given herbal and plain water enema, 10 received treatment with over the counter medications such as acetaminophen (paracetamol) among others, while 2 were taken to prayer houses for prayers and one had olive oil applied all over his/her body.

Table 3: Pre-hospital treatment administered to participants.

	N=52	%
No treatment	23	44.2
Herbal/plain water enema	16	30.8
Over the counter medicines	10	19.2
prayers	2	3.9
Olive oil applied all over the body	1	1.9
Total	52	100

Duration of hospitalization ranged from few hours to 16 days. Majority (73.1%) of the patients were discharged home after successful treatment, 15.4% left against medical advice, 11.5% died and no patient was referred to a tertiary health facility. Of the 6 patients who died, sepsis and severe malaria with severe anaemia were responsible for two deaths each while cerebral malaria and status epilepticus were responsible for 1 death each (tables 4 and 5).

Table 4: Outcome

	N=52	%
Discharged	38	73.1
Left against medical advice	8	15.4
Died	6	11.5
Referred	0	0
Total	52	100

Table 5: Causes of death among the patients

Diagnosis	Number of patients	Number dead	% dead
Cerebral malaria	11	1	9.1
Sepsis	3	2	66.7
Severe malaria with severe anaemia	5	2	40.0
Status epilepticus	3	1	33.3

DISCUSSION

Most reports on acute seizures in children in Nigeria were from studies conducted in tertiary health facilities. This study was therefore embarked upon to ascertain the causes and outcome of acute seizures in a secondary health facility, located in Oron, Nigeria. The prevalence rate of acute seizures among hospitalized patients in this study (5.27%) was lower than 12.4% reported in North-western Nigeria a decade ago.[14] This might be attributable to the fact that most cases are treated at home and presentations to lower healthcare facilities for treatment.

Male preponderance observed in this present study was not surprising. This has been reported in previous studies within and outside Akwa Ibom State among children with acute seizures.[1,10,15-16] Taylor et al were of the opinion that the difference might be due to a comparatively earlier maturation of the female brain which could provide protection against potential triggers such as fever.[17] It could also be explained by the cultural practice in our environment of seeking for medical treatment earlier for the male children.[1,10]

The observation that acute seizures were more prevalent in children below the age of five years and less common in older children is consistent with earlier reports from within and outside Nigeria.[1-6] This could be explained by the fact that febrile convulsion which accounted for a greater proportion of acute seizures is common in children between the ages of three months and six years.

Most of the patients in the present study were from the middle and lower socio-economic classes with only about 6% from the upper social class. This was at variance with the observation by Eseigbe et al in North-western Nigeria.[14] The present finding could be explained by the fact that patients from the upper social class have parents who could afford treatment from the private health facilities where patients are fewer.

Fever was a presenting symptom in almost all the patients in this study. Many studies appeared to have documented febrile convulsion as the commonest cause of acute seizures in children.[1,4,5-6,8-10,14] Though febrile convulsion is always scary to the caregiver, s/he should be educated on what to do when a child is actively convulsing, such as placing the patient on the floor or ground, removing any harmful object from the scene, placing child on the side to prevent choking, loosening any clothing especially around the neck and chest along with administration of antipyretics and tepid sponging after the seizure had ceased. This health education should be carried out periodically in the paediatric clinic for the mothers/caregivers.

The findings that most children presented with generalised seizure had also been documented by other authors.[6,14] Generalized seizures could easily be recognised by the untrained eyes but this is not the case with subtle and other forms of seizures.

Febrile convulsion being a major cause of acute seizures in children had been documented in both developed and developing countries. Though bacterial infections such as acute respiratory infection had been documented as a major cause of febrile convulsion in other settings,[3,4] studies in Nigeria, a country which is endemic for malaria has consistently reported malaria as a major cause of febrile convulsion.[1,8-10,14] This highlights the need to pursue already existing malarial control programmes to combat this endemic disease in our environment and public health education to treat febrile illnesses on time.

Pre-hospital treatment received by the patients in this study followed the trend already reported by other studies in our environment.[1,10,14] Most striking aspect is the cultural practice of use of herbal enema by most of the caregivers as pre-hospital treatment with the hope that it will cleanse the bowel and so cure the patient. As the chemical compositions and standardized doses of these herbs are unknown, these patients stand the risk of being overdosed by these herbal concoctions with attendant toxic effects on some of the organs in the body. These could be responsible for increased morbidity and mortality in children with acute seizures. There is therefore need for public enlightenment to dissuade the caregivers from use of these chemicals in treating acute illnesses such as fever and seizures.

Mortality rate of 11.5% is lower than 19% which was reported among children with status epilepticus in a tertiary health facility in our environment about a decade age.[10] This is encouraging and may point to the fact that, some of the public health programmes put in place for reduction of under-five mortality rate is yielding positive results.

LIMITATION OF THE STUDY

Most investigations which would have helped in arriving at some diagnoses such as random blood sugar, serum urea/electrolyte/creatinine levels, cerebro-spinal fluid (CSF) microscopy culture and sensitivity (m/c/s) as well as blood culture were not done due to non-availability of reagents and manpower to carry out the tests. Most of the patients with severe malaria and sepsis that presented with acute seizures had empirical correction for hypoglycemia at presentation. These may account for the absence of hypoglycemia and hyponatremia as causes of acute seizures in this study.

CONCLUSION

This study has highlighted the common causes of acute seizures in Oron, a coastal town in Southern Nigeria and malaria had been implicated as the commonest cause. There is need to improve community awareness, establish appropriate caregiver health seeking behaviour and promote malaria control programmes.

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