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Research Article

Clinical Profile and Outcome of Children Admitted with Acute Seizures at Two Tertiary Hospitals, Zimbabwe

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Keywords

- Acute seizures; Generalised seizures; Status epilepticus; Febrile convulsions

Abstract

Objective: To describe the clinical profile, mortality and short term outcomes of children hospitalised with acute seizures at two tertiary hospitals in Harare, Zimbabwe.

Methods: A hospital based, cross-sectional study conducted among children aged 6 months to 12 years admitted with acute seizures at two tertiary hospitals in Harare, Zimbabwe. Children with known epileptic seizures were excluded. Demographics, clinical presentation, possible cause of acute seizures and short term outcome were recorded.

Results: A total of 191 children were recruited during the period April to October 2017 of whom 116 (60.7%), were males. Seizures were more common in younger children (6-59 months), than in older children (5-12 years). One hundred and seventy-two (90.1%), had generalized seizures and 19 (9.9%) had focal seizures. Febrile seizures occurred in 113 (59.2%), of the study participants, with respiratory tract infections as the most common cause of fever. Malaria was the second commonest diagnosis in 21 (11%), of whom 20 (95.2%), presented with generalized seizures. The presence of fever (85.7%), or focal seizure (32.1%), was independently associated with the development of status epilepticus. Clinical meningitis (9.4%), and status epilepticus (14.7%), were independently associated with mortality.

Conclusion: Seizures were more common in younger children (6-59 months), than in older children (5-12 years). Febrile seizures were the most common cause of acute seizures. The presence of fever or focal seizure was independently associated with the development of status epilepticus. Children with meningitis and status epilepticus were more likely to die, therefore it is very important to prevent and treat meningitis and seizures early and appropriately.

ABBREVIATIONS

ILAE: International League against Epilepsy; HIV: Human Immunodeficiency Virus; DNA: Deoxyribonucleic Acid; PCR: Polymerase Chain Reaction; RDT: Rapid Diagnostic Test; MPs: Malaria Parasite Smear; CSF: Cerebrospinal Fluid; CT: Computed Tomography; EEG: Electroencephalogram; CNS: Central Nervous System; m/c/s: microscopy, culture, and sensitivity; SPSS: Statistical Package for the Social Sciences; ICP: Intracranial pressure; HAART: Highly Active Antiretroviral Treatment; PMTCT: Prevention of mother to child transmission.

INTRODUCTION

Seizures are the most common pediatric neurological disorder globally [1]. A seizure consists of transient symptoms and/ or signs due to abnormal excessive or synchronous neuronal activity in the brain with a clear start and finish (ILAE 2015) [2]. Seizures can present as a wide array of physical changes or changes in consciousness and of varying severity. According to World Health Organization (WHO) emergency, triaging and treatment (ETAT), a seizure is recognized as one of the most common danger sign in children [3].

Acute seizures are categorized broadly as unprovoked, acute symptomatic (brain insult), and childhood febrile seizures [4]. The ILAE 2017 classification of seizure types, is clinically based on onset of seizures as focal onset, generalized onset and unknown onset [5].

Four to ten percent of children suffer at least one episode of seizure in the first 16 years of life [1]. The incidence is highest in children less than 3 years old, with a decreasing frequency in older children [1]. Seizures account for about 1% of all emergency department visits globally [4]. In children and adolescents, the incidence of epilepsy defined as recurrent unprovoked seizures, is relatively consistent across all populations studied, ranging from 50 to 100 per l00,000 person-years [6]. The standardized mortality rate is highest in the youngest patients as well as in those with symptomatic seizures [7]. The lifetime prevalence of

febrile seizures in children (≤ 6 years), is 2–5% in American and European studies [8].

The incidence of acute symptomatic seizures in young children admitted to hospitals in Africa is in the excess of 1,000 per 100,000/year, which is likely to be grossly underestimated because only a proportion of children with seizures are treated in the hospital [9,10]. There are, however, few epidemiological studies of acute symptomatic seizures in Sub-Saharan Africa including Zimbabwe. Acute symptomatic seizures are a major cause of morbidity and mortality [11], therefore understanding the clinical profile and causes of seizures may guide management of children presenting with acute seizures. This study describes the clinical profile, possible etiology and outcome among children presenting with acute seizures at two tertiary hospitals.

MATERIALS AND METHODS

This was a descriptive hospital based cross sectional study done at Harare and Parirenyatwa paediatric wards, Zimbabwe, between April and October 2017. Parirenyatwa and Harare hospitals function as secondary and tertiary referral teaching hospitals situated in Harare, the capital city of Zimbabwe. These two hospitals receive referrals from Harare municipal clinics and surrounding Mashonaland provinces. Both hospitals children unit consists of paediatric general wards, intensive care unit, and observation ward.

Children aged 6 months to 12 years admitted with acute onset of seizures at these two hospitals whose parents or guardians signed written informed consent forms were recruited within 24 hours of hospitalisation. Children who presented with seizures but being known epileptic patients not or on antiepileptic medications, with known intracranial pathology such as patients being followed up for cerebral palsy or space-occupying lesion, and those with psychogenic non-epileptic seizures (defined as altered movement, sensation or experience, similar to epilepsy, but caused by a psychological process) [12], were excluded in this study. Seizures were classified using the New ILAE 2017[5] .

Measures

A structured study questionnaire was used for the collection of information from the parents/ guardians within 24 hours of admission. Sociodemographic characteristics, clinical description of the features of the seizures, its duration, associated symptoms-fever, cough, diarrhoea, vomiting and headache, were obtained. Past medical history of febrile seizures, family history of seizures or epilepsy, developmental history, immunisation history were recorded. Detailed clinical examination was performed, which included vital observations, anthropometric measurements, systems examination with particular attention to neurological assessment were conducted on admission and discharge. Daily follow up of the recruited children were done until discharge or death.

In order to manage and determine the possible aetiology of seizures, laboratory tests were carried out which included full blood count, serum electrolytes, urea and creatinine, blood sugar levels, HIV rapid antibody test on parents, HIV DNA PCR on exposed infants, malaria RDT and MPs, and CSF analysis. Neuroimaging: EEG, brain CT scan if performed were recorded and analysed.

Definitions of Etiological causes

In this study, febrile seizure was defined as a seizure occurring in childhood after one month of age associated with fever (axillary temperature of 38 degree celcius and above), not caused by an infection of the CNS, without previous neonatal seizures or previous unprovoked seizure and not meeting the criteria for other acute symptomatic seizures (ILAE, 1993) [13]. Febrile seizures were classified as simple or complex; a complex febrile seizure lasts > 15 min, is focal rather than generalized and/or recurs within 24 h (American Academy of Paediatrics, 2008) [14].

Status epilepticus is diagnosed as a continuous seizure activity or recurrent seizure activity without regaining of consciousness lasting for > 30 min [15].

In this study, malaria was considered as the diagnosis if RDT or malaria parasite slides are positive for falciparum malaria. All patients from or had a history of travel to a malaria area, or suspected to have malaria had RDT and or MPs performed.

Meningitis or encephalitis was considered as the final diagnosis clinically, or as evidenced by CSF results. The clinical symptoms and signs suggestive of meningitis included fever, irritability, bulging fontanelles, separated sutures, and neck stiffness [16]. Lumbar puncture was performed on suspected cases of meningitis. CSF biochemistry (protein and glucose), and m/c/s were analysed.

Hypoglycaemia was defined as the cause if a patient who was fitting, had a low serum glucose level of below 3mmol/l and the seizures stopped and the patient recovers fully neurologically after receiving 2-5 mls/kg of 10% dextrose intravenously [17].

Hypertensive encephalopathy was considered as the diagnosis after excluding other causes in a child with blood pressure measurements (systolic and diastolic) above 95th percentile for age, sex and height and requiring antihypertensive drugs for treatment [18]. American Academy of Paediatrics blood pressure for age and height reference percentile charts were used to identify abnormal blood pressure levels [19].

Epilepsy was defined as 2 or more unprovoked seizures (ILAE, 1993), with or without EEG confirmation [20].

Stroke was considered as the diagnosis if the duration of hemiplegia/hemiparesis (focal deficit), is prolonged to more than 24 hours relative to the duration of the preceding seizure [21].

Accidental cause was defined if a child had a seizure that occurs after an accidental incident such as head trauma, drowning, and organophosphate poisoning.

Gastroenteritis with moderate/severe hyponatremia (serum sodium level less than 130 mmol/l), or moderate /severe hypernatremia (serum sodium levels more than 150 mmol/l), was considered the final diagnosis in an afebrile patient if no other known cause of seizures directly was ascertained [22,23].

Outcome assessment

The final outcome was recorded in three categories; discharged after recovery, discharged with neurological deficits, and death.

Data analysis

Data was stored in REDCaP 6.16.0, and analysed using SPSS for Windows Version 16.0. Standard descriptive statistics such as means, medians, interquartile ranges, and proportions were used for continuous and categorical variables respectively and were used to summarize socio-demographic characteristics. Bivariate analysis was performed to determine the association between outcome variables. A multiple logistic regression analysis was done on study factors with significance level $p < 0.25$ from bivariate analyses to identify independent factors associated with status epilepticus and or death. All statistical significance was evaluated at $p < 0.05$ (two-sided).

RESULTS

Study population

Among the total of 3210 children admitted during the period April to October 2017, a total of 202 (6.3%) children aged between 6 months and 12 years were admitted with acute seizures at the two hospitals' paediatric casualties, and 191 (94.6%), were recruited as shown on Figure 1.

The 11 (5.6%), patients not recruited consisted of 2 patients whose parents did not consent to the study, 5 patients absconded before consenting, and 2 patients who were managed for febrile convulsions and discharged from the hospital in less than 12 hours after presentation. Two patients were seen and examined more than 24 hours after admission, and therefore were excluded from further analysis. The informants were the mothers in 153 (80.1%), fathers 18 (9.4%), and guardians 20 (10.5%). One of the 20 guardians was not the usual caregiver.

Demographic and Clinical profiles in children with acute seizures

There were 116 (60.7%), males and 75 (39.3%), females with male to female ratio of 1.55:1. Figure 2 shows the absolute numbers of children admitted with acute seizures, and gender and age distribution.

The mean (SD), age recruited was 3.2 (2.6), years, with children between 6-59 months contributing 158 (83%), and those between 5-12 years were 33 (17%), of the study population. Eight (4.2%), of the study population were not up to date with their immunisations as per Zimbabwe immunization schedule, but all had received all their primary vaccines series.

One hundred and seventy-two (90.1%), had generalized onset of seizures and 19 (9.9%), had focal seizures (Table 1). Generalized seizures were more common than focal seizures in both sexes (M= 94.8%; F = 82.7%). There was a statistically significant higher proportion of males compared to females presenting with generalized seizures (p = 0.006) (Table 1).

History of febrile seizure, HIV infected/exposed and history of developmental delay were not significantly associated with

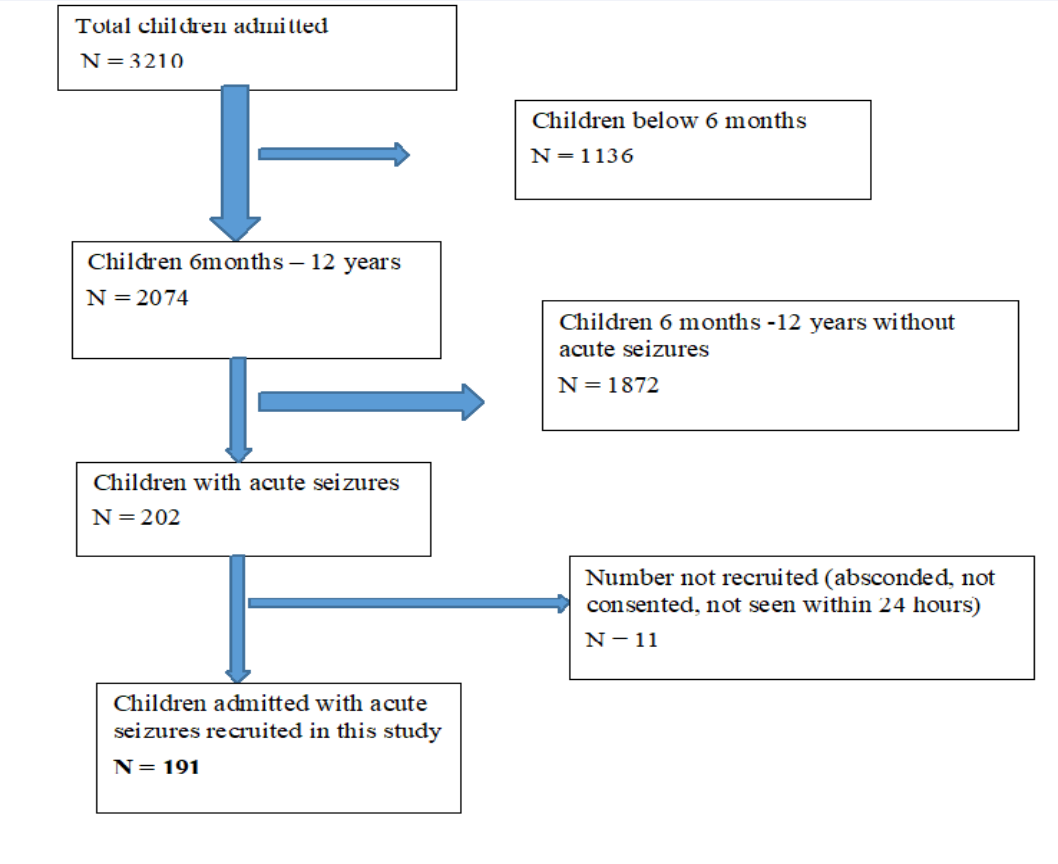

Figure 1 Admissions at Parirenyatwa and Harare Tertiary children hospitals in 6 months.

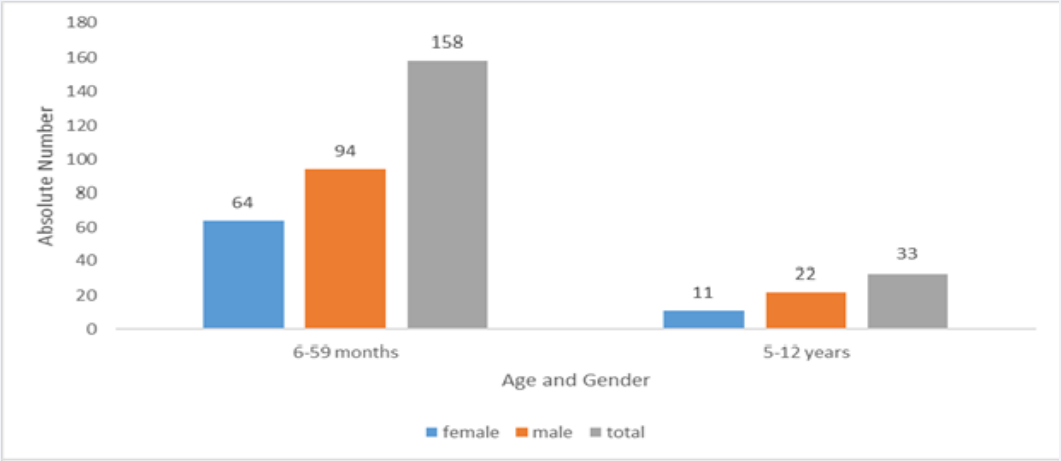

Figure 2 Age and gender distribution of children admitted with acute seizures.

Table 1: Comparison of demographic and clinical profiles of children with seizure type.

Variable	Category	Generalized	Focal	OR(95%CI)	p-value
		n=172 (%)	n=19 (%)		
Demographic characteristics					
Sex	Male	110 (64.0)	6 (31.6)	3.84(1.39 – 10.62)	0.006*
	Female	62 (36.0)	13 (68.4)		
Age category	6–59 months	143 (83.1)	15 (78.9)	1.31(0.40 – 4.24)	0.423
	5–12 years	29 (16.9)	4 (21.1)		
Clinical characteristics					
Fever	Yes	145 (84.3)	14 (73.7)	0.25(0.17 – 2.08)	0.192
	No	27 (15.7)	5 (26.3)		
History of febrile seizure	Yes	23 (13.4)	1 (5.3)	2.78(0.35 – 21.83)	0.276
	No	149 (86.6)	18 (94.7)		
Family history of Epilepsy	Yes	15 (8.7)	2 (10.5)	0.81 (0.17 – 3.86)	0.509
	No	157 (91.3)	17(89.5)		
Family history of Febrile seizure	Yes	16 (9.3)	2(12)	0.87(0.18 – 4.12)	0.696
	No	156	17 (88)		
HIV status	Negative	155 (90.1)	15 (78.9)	2.43(0.72 – 8.16)	0.235
	Infected/Exposed	17 (9.9)	4 (21.1)		
Developmental history	Normal	164 (95.3)	17 (89.5)	2.41(0.47 – 12.28)	0.261
	Delayed	8 (4.7)	2 (10.5)		

the development of a generalized seizure. There was also no significant association between a fever, family history of epilepsy, family history of febrile seizure and the occurrence of generalized seizure (Table 1).

Respiratory tract infection and diarrhoea were the major causes of fever in children with febrile seizures. Respiratory tract infections were present in 79 (41.4%), and among these 74 (93.7%), were in 6-59 months' age group. Diarrhoea was present in 52 (27.2%), and among these 43 (82.7%), were in 6-59 months' age group. Six (3.1%), of the study population had both respiratory and diarrhoea, all six were in 6-59 months' age group. There was no statistically significant difference between the two (respiratory tract infection and diarrhoea), and seizure semiology (generalized and focal).

Ten (5.2%) of the study population had isolated developmental delay (5 language, 3 gross motor, 2 fine motor),

of whom 8 presented with generalized seizures and 2 had focal seizures. Only one patient admitted with seizures had regression of milestones with concurrent chronic malnutrition.

Causes of Acute Seizures

Of the febrile seizures shown on Figure 3, simple febrile seizures contributed 103 (91.2%), and complex febrile seizures 10 (8.8%). All except one patient aged 5.5 years, diagnosed with febrile seizures, were between 6-59 months of age.

Eighteen children were diagnosed clinically with meningitis/encephalitis with 15 (83%) of them having lumbar puncture performed for CSF analysis. Three of the CSF samples showed abnormal biochemistry studies with elevated protein levels and low glucose levels. Nine CSF samples had m/c/s done, and none of them had a microbial growth detected.

Twenty-one children were diagnosed with malaria, out of them 20 (95.2%), presented with acute generalized seizures and one had acute focal onset seizures. One patient who had malaria also had moderate hypernatremia of 161 mmol/l.

Other diagnoses made were epilepsy 4 (2.1%), stroke 4 (2.1%), afebrile gastroenteritis with hyponatremia 2 (1.1%), accidental 4 (2.1%), which included trauma (1 patient), drowning (2 patients) and organophosphate poisoning (1 patient). Cerebral palsy, hypocalcaemia, and subdural empyema contributed one case each, and 3 (1.6%), children admitted with afebrile seizure, a cause could not be determined.

All 8 patients who had hypertensive encephalopathy were above 4 years of age, 6 of them had nephritis. Two patients who had hypertensive encephalopathy died, one had a chronic renal failure due to posterior urethral valves, and the other had clinically diagnosed coarctation of aorta with concurrent histologically proven tuberculosis (TB) axillary adenitis.

Neuroimaging and EEG

Computed tomography scan was requested in 38 (19.9%), of the patients, and was done on only 13 patients due to financial constraints. Of the 13 who had brain CT scan done, 3 were reported normal, 9 had brain edema secondary to post infarction/hypoxic brain injury, and 1 had subdural empyema.

Only one patient, an 18 months old female, diagnosed of generalized epilepsy had an EEG done 48 hours after presented with status epilepticus. The EEG showed bilateral 4-5 Hz epileptiform discharge suggestive of generalized epilepsy and was discharged on oral phenobarbitone. This patient had upper respiratory tract infection and fever, with a past medical history of two episodes of being managed for febrile seizures.

Clinical characteristics of children with status epilepticus (SE)

Status epilepticus was present in 28 (14.7%), of the study population on admission. Fever was a statistically significant risk factor (OR = 3.78, CI: 1.25 – 11.41), for the development of status epilepticus. Seizure type (focal seizure) (OR=7.25. CI: 2.62 – 20.08), was also a significant risk factor for status epilepticus (Table 2).

Patients who presented with status epilepticus had a longer hospital stay, mean (95% CI), of 10.8 (7.5 – 14.2), days compared to those who had no status epilepticus 5.2 (4.2 – 6.2), days. Eight (44.4%), of 18 children diagnosed with clinical meningitis or encephalitis had status epilepticus. Among patients with acute seizures diagnosed with malaria, 2 (9.5%), had status epilepticus. Four (36.4%), patients diagnosed with hypoglycaemia as a cause of the seizure had status epilepticus. Two (20%), patients diagnosed of complex febrile seizures and 2 (25%), diagnosed of hypertensive encephalopathy presented with status epilepticus.

Outcomes

The final outcome was noted as discharged and death during hospital stay. One hundred and eighty (94.2%), were discharged and 11 (5.8 %), died in hospital. Fifteen (8.3%), of those discharged had residual neurological motor function deficit.

Status epilepticus (OR = 21.33, CI: 5.23 – 87.03), and cause of acute seizures (meningitis) (OR =45.33, CI: 10.40 – 197.61), were significant risk factors for mortality (Table 3).

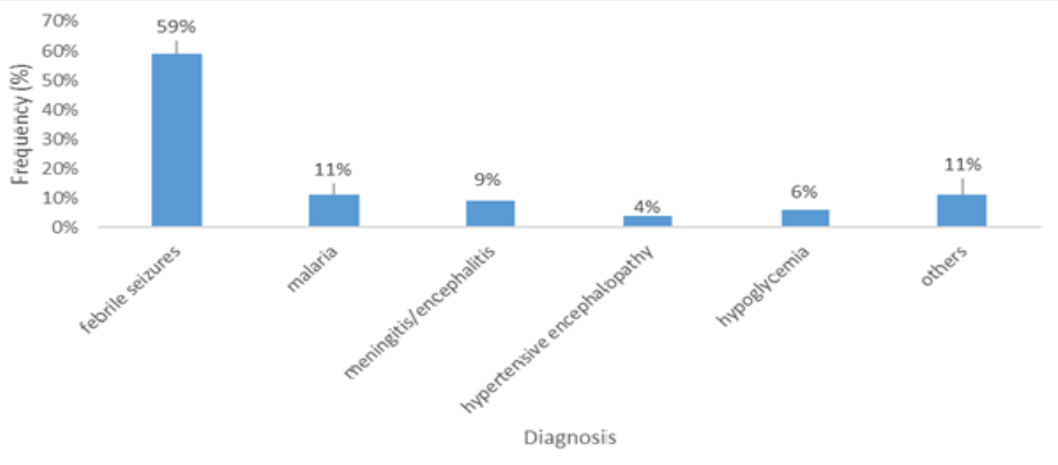

Figure 3 Possible causes of acute seizures in 191 children.

Table 2: Clinical characteristics of children who presented with status epilepticus (SE).

Variable	Category	SE	No SE	OR(95%CI)	p-value
		n=28 (%)	n=163(%)		
Sex	Female	9 (32)	66 (40)	0.69 (0.30 – 1.63)	0.403
	Male	19 (68)	97 (60)		
Age category	6 -59 months	21 (75)	137 (84)	0.56(0.22 – 1.48)	0.242
	5 – 12 years	7 (25)	26 (16)		
Fever	Yes	24 (85.7)	100 (62.5)	3.78(1.25 – 11.41)	0.009*
	No	4 (14.3)	63 (37.5)		
Seizure type	Focal	9 (32)	10 (6)	7.25(2.62 – 20.08)	0.001*
	Generalised	19 (68)	153 (94)		
Past history of febrile seizure	Yes	3 (11)	21 (13)	0.81 (0.22 – 2.93)	0.518
	No	25 (89)	142 (87)		
HIV status	Infected/Exposed	6 (22)	15 (9)	2.69(0.94 – 7.67)	0.056**
	Negative	22 (78)	148 (91)		
Nutritional Status	Normal	27 (96)	148 (90.8)	2.74 (0.34 – 21.59)	0.284
	Malnutrition	1(4)	15 (9.2)		

Table 3: Outcome in relation to demography, clinical profile, and status epilepticus.

Variable	Category	Died	Discharged	OR(95%CI)	p-value
		n= 11 (%)	n= 180 (%)		
Gender	Female	5 (45)	70 (39)	1.31(0.39 – 4.45)	0.446
	Male	6 (55	110 (61)		
Age category	6 – 59 months	10 (91)	148 (82)	2.16(0.27- 17.50)	0.403
	5 -12 years	1 (9)	32 (18)		
Seizure type	Focal	3 (27)	16 (9)	3.84(0.93 – 15.94)	0.082
	generalized	8 (73)	164 (91)		
Status epilepticus	Yes	8 (73)	20 (11)	21.33(5.23 – 87.03)	0.0001*
	No	3 (27)	160 (89)		
Fever	Yes	7(63.6)	117 (65)	0.94 (0.27 – 3.34)	0.58
	No	4(36.4)	63(35)		
HIV status	Negative	7 (64)	163 (91)	0.18 (0.05 - 0.69)	0.021*
	Positive/Exposed	4 (36)	17 (9)		
Nutritional status	Normal	10 (91)	165 (92)	0.91 (0.11 – 7.59)	0.628
	Malnutrition	1 (9)	15 (8)		
Causes of Acute Seizure	Meningitis	8(72.7)	10(5.6)	45.33(10.40 – 197.61)	0.001*
	Hypertensive encephalopathy	2(18.1)	6 (3.3)	5.49 (0.99 – 30.32)	0.087
	Hypoglycemia	1(9.1)	11(6.1)	1.54(0.18 – 13.11)	0.52

There was no significant association between nutritional status, gender, age, seizure type and outcome of death.

All children diagnosed with febrile seizures (simple and complex) (113 patients) and malaria (21 patients) were discharged. The presence of a fever (AOR= 4.39, 95%CI: 1.36 – 14.22), and the type of seizure (focal) (AOR = 7.75, CI: 1.85 – 32.51) were independently associated with the development of status epilepticus. In a multiple logistic regression analysis, status epilepticus and clinical meningitis were independently associated with mortality.

Anti-epileptic Medication

Twenty-nine (15.1%), patients received antiepileptic drugs during hospitalization with 5 of them receiving only diazepam stat doses, one patient 11 years old female, who was managed for status epilepticus due to complicated meningitis with minimal subdural empyema noted on CT scan received antibiotics and midazolam infusion in intensive care unit and discharged with residual motor function deficits (increased tone and reflexes), went home on oral phenytoin.

Five patients referred from provincial hospitals with status epilepticus had received diazepam and phenobarbitone stat doses. Other antiepileptic drugs used for generalized onset of seizures (16 patients), were carbamazepine, phenobarbitone, phenytoin and sodium valproate, for patients admitted with focal onset of seizures were phenytoin (2 patients), and phenobarbitone (6 patients).

DISCUSSION

In this study, seizures were more common in younger age group (6-59 months), compared to older age group (5-12 years), with a male predominance in both age groups. These findings of

younger ages and males being more likely to experience seizures are similar to studies done in United States of America, India, China and Kenya [4,15,24-26].

Most of the study participants (90.1%), had generalized onset of seizures. This is similar to findings in a study done by Idro et al in Kenya where generalized seizures were more common than focal seizures [26]. Absence seizures were not seen in this study. The absence seizures were similarly not observed in studies done in India and Kenya [25,26]. However, absence seizures could have been missed due to their subtle signs and symptoms.

In this study, a fever (83%), was the commonest complaint in children presenting with acute seizures. Fever was associated with seizures in 54.4% of the study participants in India, at a tertiary care hospital PMCH Patna, and was present in 53.5% of the study participants in a study done at a tertiary hospital in Western Nepal [15,27]. In Kenya, a study done in a rural malaria endemic area in children less than 13 years old, fever was found in 92.1% of the children with seizures [26].

Respiratory infection (41.4%), and diarrhoea (27.2%), were the common comorbidities found. This finding was also similar to the findings by Idro et al., and Kariuki et al., done in Kenya in children aged 0-13 years, who also determined that respiratory tract infections and diarrhoea were major comorbidities in children with acute seizures [26,28]. Globally, respiratory tract infections and diarrhoea are the commonest cause of morbidity among all children [29].

Seven (3.7%), of the study population were HIV infected. Six were on HAART on presentation, and the other one was commenced on HAART before discharge. In a retrospective study done in South Africa, acute symptomatic seizures were reported in 5-11% of children with HIV infection [30]. A Botswana study showed that early initiation with combination ART may be protective against HIV infected children [31]. The lower rate of HIV infected children with seizures compared to a South African study [30], would directly reflect the impact made by the PMTCT programme in Zimbabwe [31]. In addition, this observation could also be attributed to early mortality in HIV infected/exposed infants [32].

There were 24 (12.6%), children admitted with seizure with a previous history of febrile seizure. Febrile seizure in infants is a risk factor for developing seizures later in life [33,34]. Family history of febrile seizure, family history of epilepsy was associated with increased risk of seizures in childhood [33-35]. In this study, family history of febrile seizures and family history of epilepsy were found in 8.4% and 9.1% respectively.

Febrile seizures were the commonest diagnosis (59.2%), of the study population, with simple febrile seizures contributing (91.1%), and complex febrile seizures (8.8%), of the patients with febrile seizures. Other studies have shown that most febrile seizures are generalized tonic-clonic seizures, which are short in duration (<15 min), and few recur during the illness [34,35]. The incidence of febrile seizures in Africa is not known, majority of parents would consult traditional healers first and simple febrile seizures most likely resolve without being referred to hospital [36].

Malaria was the second commonest diagnosis (11.0%), in this study. There was no attempt to differentiate seizures due to cerebral malaria or febrile seizures based on malarial infection. Malaria was the commonest aetiological factor associated with seizures in a study done in a malaria endemic area in Kenya rural area [26]. The current study was conducted in Harare, a malaria free zone, and also during a dry season. The contribution of malaria is greatly biased since simple seizures in a patient with malaria would not be referred to the tertiary hospitals.

Meningitis and / encephalitis was the third commonest diagnosis clinically and or by CSF studies, contributing 9.4% of the study population. The most common causes of acute symptomatic seizures in young children from the USA and Taiwan include meningitis and encephalitis [37,38]. In African studies, it has been difficult to clearly separate febrile seizures from acute symptomatic seizures due to the limited resources to fully investigate the cause of seizures. In this study, all the patients with meningitis and encephalitis received antibiotics before being referred to the tertiary hospitals, and also the local laboratories were not able to culture and isolate viral causes, this could explain the unknown viral and bacterial aetiology of meningitis in this study [16].

Fever and focal seizure type were independent risk factors for status epilepticus. Status epilepticus was present in 28 (14.7%), of the study population. The proportion of status epilepticus was higher than that recorded in a Kenyan study, which showed 10.9% of their study population aged 0-13 years [26]. Studies done in India on children aged 6 months to 15 years showed lower proportions of status epilepticus compared to this study [15,27].

Status epilepticus and meningitis were independent risk factors most significantly associated with mortality in this study. These findings are comparable to findings from the study done in Kenya which found that in addition to, focal seizures, coma, metabolic acidosis and bacteremia, pyogenic meningitis and status epilepticus were also independently associated with mortality [26].

In this study, 180 (94.2%), were discharged and 11 (5.8 %), died in hospital. The mortality rate was higher than in studies done in Kenya (3.1%), and Western Nepal, India (4.4%), but it was lower than that found in a study done at Patna in India (9.3%) [15,26,27]. Fifteen (8.3%), of those discharged had residual neurological motor dysfunction, this proportion was higher than what was reported (1.3%), in a study from Kenya [26].

CONCLUSION

Seizures were more common in younger children (6-59 months), than in older children (5-12 years), with male preponderance. Febrile seizures were the most common cause of acute seizures. The presence of fever or focal seizure was associated with the development of status epilepticus. Children with meningitis and status epilepticus were more likely to die, therefore it is very important to prevent and treat meningitis and seizures early and appropriately.

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