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PREVALENCE AND OUTCOME OF CHILDHOOD STATUS EPILEPTICUS IN A TERTIARY HOSPITAL IN THE COASTAL CITY OF CALABAR, NIGERIA
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PREVALENCE AND OUTCOME OF CHILDHOOD STATUS EPILEPTICUS IN A TERTIARY HOSPITAL IN THE COASTAL CITY OF CALABAR, NIGERIA

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ABSTRACT

Background: **Status epilepticus (SE) is the most common neurological emergency encountered in childhood. It is life threatening with risk of neurological sequelae such as epilepsy and cognitive impairment. The outcomes are often determined by the cause.**
This study is aimed at highlighting the aetiology and outcome of SE with a view to drawing the attention of healthcare providers to the need for prompt management to prevent neurological sequelae.
Method: **A retrospective study of all children admitted through the Children Emergency Unit of the University of Calabar Teaching Hospital between January and December 2019 with a diagnosis of SE. All children who had seizure lasting 30 minutes and above or serial convulsions without regaining consciousness in between episodes, were recruited into the study. The demographic characteristics and clinical parameters were documented. The treatment modalities and the outcomes were also documented. The data obtained was analysed using SPSS software version 23. Results were expressed in simple proportions and percentages.**
Results: **The prevalence of status epileptics was 3.03%. Viral encephalitis, cerebral malaria, epilepsy and meningitis were the major underlying causes. Children with SE due to CNS infection were more likely to suffer neurological deficit or death. Children with seizures lasting longer than one hour had a relatively poorer outcome; delayed presentation to health facility also portends poor outcome.**
Conclusion: **CNS infections are the major cause of SE in Nigeria. Outcome is determined by the aetiology, duration of seizures and timeliness of intervention. Protection against infections and prompt initiation of appropriate treatment improves outcome.**

INTRODUCTION

Status epilepticus (SE) is a common neurological emergency encountered in childhood. Healthcare providers therefore need to be aware of the acute and chronic implications so as to appropriately manage the victims and counsel patients and their families.[1] It is a life threatening condition with the risk of major neurological sequelae in childhood.[2,3,4] The outcome from an episode of SE appears to be determined by the underlying cause, and its duration before therapeutic intervention; the longer the duration of the seizure, the more difficult it is to terminate.[4,5]

The incidence of status epilepticus in children is reported to be 18 per 100000 per annum.[6] Studies have shown that status epilepticus is associated with high mortality and morbidity rates but there are no sufficient data to determine if the outcomes are actually due to status epilepticus per se or is a consequence of other factors like mode of treatment or the underlying cause of the status.[7]

There are multiple conditions that can lead to status epilepticus in children such as fever, central nervous system infections, hypoxia, head trauma, cerebral malformations and chronic epilepsy.[8,9]

Previously reported adverse outcomes of status epilepticus include permanent neurological damage, subsequent epilepsy, cognitive impairment and hippocampal injury.[10]

Presumably, the underlying causes of status epilepticus tend to differ geographically. The aim of this study is to determine the prevalence and outcome of status epilepticus in Nigerian children admitted into a tertiary health facility in Calabar, Nigeria. It is necessary to draw the attention of healthcare providers on the need to promptly and appropriately manage children with status in order to prevent the short and long-term adverse neurological sequelae. It is possible to offer suggestions regarding possible prevention of both the cause and the effect.

PATIENTS AND RECORDS

This survey is retrospective review of all children admitted to the Paediatric service of the University of Calabar Teaching Hospital (UCTH), Calabar, Nigeria, from January through December 2019 with a diagnosis of status epilepticus. Ethical approval for the study was obtained from the Ethics Committee of the hospital. All children who had a seizure, lasting 30 minutes and above or who had series of convulsions without regaining consciousness in-between, were recruited into the study.

For the purpose of this study all the case records of these patients were pulled out for analysis. The demographic characteristics abstracted from the records of the children include the age and gender.

The clinical parameters of each child notably; the type of seizure, duration of convulsions, past history of seizures, history of fever, duration of loss of consciousness were recorded. Also noted was history of epilepsy, compliance to treatment/ follow up appointments. The laboratory investigations carried out in the course of admission were also documented. Diagnosis of viral encephalitis was presumed by a clear cerebrospinal fluid, exclusion of meningitis from CSF culture and a negative blood film for malaria parasite since there were no facilities for viral cultures. Other diagnoses were confirmed with laboratory investigations obtained from the patients' medical records. Documentation of home

intervention/self-medication before presentation, and details of the mode of treatment in the hospital, was noted. The eventual outcome was noted as: recovered fully; recovered with sequelae or death.

The data obtained was entered into a Microsoft excel spread sheet and transferred into SPSS software version 23 for analysis. Simple proportions and percentages were used to analyse the data.

RESULTS

Of the 1320 patients admitted into the Children Emergency Unit of UCTH during the study period, 40 had status epileptics giving a prevalence of 3.03%. Twenty-five (62.5%) of the children were males, 15 (37.5%) were females giving a male to female ratio of 1.7: 1. Fifty of the children in the study are between 1-5 years. (Table 1)

Table 1

Age/gender distribution of children with status epilepticus

Age (years)	**Total N=40**	**Males N-25**	**Females N=15**
< 1	6	4	2
1-5	20	14	6
6-10	7	3	4
>10	7	4	3

Viral encephalitis was the commonest identified cause of status epilepticus in 17(42.5%) of the 40 children followed by cerebral malaria and epilepsy in seven children (17.5%) each. Others are meningitis in five (12.5%) and three (7.5%) febrile status. Two of the children viral encephalitis had HIV encephalopathy. (Table 2)

Table 2

Underlying causes of status epilepticus

Etiology	**Frequency N=40**	**Percentage N=100%**
Viral encephalitis	17	42.5
Cerebral malaria	7	17.5
Epilepsy	7	17.5
Meningitis	5	12.5
Febrile status	3	7.5
Microcephaly	1	2.5

**** Two of these were HIV patients.***

Table 3 shows that children with febrile seizures, epilepsy and microcephaly recovered without any additional sequelae. Two of five children (40%) with meningitis and 2/7 (28.5%) with cerebral malaria had neurological sequelae. The worst outcome was among children with encephalitis where only 6/17 (35%) fully recovered. All four deaths recorded in the study were due to viral encephalitis.

Table 3

Outcome of status epilepticus related to underlying cause

Etiology	Total N=40	Fully recovered N=25	Neurological deficit N=11	Death N=4
Meningitis	5	3	2	0
Cerebral malaria	7	5	2	0
Viral encephalitis	17	6	7	4
Febrile seizures	3	3	0	0
Epilepsy	7	7	0	0
Microcephaly	1	1	0	0

Three out of five (60 %) of children who presented with seizures lasting about 30minutes recovered fully while 2/5(40%) had a poor outcome (neurological deficit or death), conversely, 3/12 (25%) of children with longer duration of seizures (more than 2 hours) recovered without any sequelae while 9/12 (75%) who had devastating outcome.(Table 4).

Table 4

Outcome in relation to the duration of seizures

Duration of seizure (hours)	Total N=40	Recovered N=25	Neurological deficit. N=11	Dead N=4
½	5	3	1	1
>1/2 to 1	15	14	1	0
>1-2	8	5	3	0
>2	12	3	6	3

Table 5 shows the outcome status in relation to the duration of illness before presentation. Five out of the six children with who presented on the day of onset of illness recovered fully whereas only 5/16 (31.3%) of those who presented after one week of onset of illness recovered fully while 11/16 (68.8%) had poor outcome.

Table 5

Outcome related to duration of illness before admission

Duration(days)	Total N=40	Recovered N= 25	Neurological deficit. N=11	Dead N=4
Less than 1	6	5	1	0
1-3	13	11	2	0
4-6	5	4	1	0
7 days and above	16	5	7	4

DISCUSSION

The prevalence of status epilepticus in the study is 3.03% among children admitted to the Children Emergency Unit in our facility. This is lower when compared to the 14.1% obtained in Western Nigeria.[11] The apparently lower prevalence in our study is

due to the inclusion of all children admitted into Children Emergency Unit in our study whereas Olubosede *et al* [11] considered only children with convulsion. This prevalence rate obtained in Calabar may not accurately represent a true picture because of the stigma attached to seizure disorder which prevents some caregivers from reporting to hospital with children that have seizures whereby some cases with status epilepticus could have died without reaching the hospital.

There was a male preponderance in status epilepticus in our study in contrast to findings in previous studies which showed no sex predilection.[12] The observed difference may be a reflection of the common aetiologies identified in this study which are known to be commoner in males than in females.[13]

That viral encephalitis, acute bacterial meningitis and cerebral malaria were the important causes of status epilepticus in this study is at par with the experience from other developing countries which showed increased incidence attributable to CNS infections.[14,15,16] Sadarangani *et al* in 2008 observed that in malaria endemic areas, malaria tops the list of causes of convulsive status epilepticus whereas in our study viral encephalitis appears the commonest accounting 42.5% of the primary causes. The variation in incidence in some parts of developing countries may be due to some level of successes scored in their immunisation and malaria control programs.[17]

The study showed that children with status epilepticus involving CNS infection had a poorer outcome compared to other causes. This may partly be due to the devastating effect of viral encephalitides and bacterial meningitides on the immature developing brain leading to neurological sequelae, and in some cases, death.[18]

It appears the longer the duration of the status the more likely an injury to the brain plus death. The present study shows that children with longer duration of active convulsion suffered more severe neurological damage compared to those with a shorter duration. This is in agreement with the long-standing hypothesis that outcomes in seizures are, at least in part, a function of brain injury induced by the prolonged seizures.[19,20]

In this study all the deaths occurred in patients who reported late to hospital which is in consonance with global experience. Studies have identified that delayed presentation to health facility caused by geographical remoteness and other logistical problems impede health service access, accentuating poorer outcomes.[21,22] In developing countries, including Nigeria, a majority of patients prefer to patronise the faith based spiritual healing, traditional healers for herbs and patent medicine stores for self-medication, and only report to hospital as a last resort.

CONCLUSION AND RECOMMENDATIONS

It is concluded that the outcome of childhood status epilepticus is determined by the underlying disease, duration of seizures and promptness in applying appropriate intervention. We recommend early presentation to health facilities and prompt initiation of appropriate treatment on arrival which can invariably improve the outcome of children with SE. Effort should be geared towards educating the populace on need for early reporting. Malaria control measures are mandatory. Encouragement of immunisation against viral and bacterial infections is directly related, hence essential in saving the brains of young Nigerians.

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