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The Pattern of Childhood Epilepsies at National Hospital Abuja Nigeria

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Abstract-

Aims: *we aim to investigate the pattern of childhood epilepsies in a tertiary hospital in the federal capital city of Nigeria.*

Settings and Design: *retrospective descriptive study*

Methods and Material: *The folders of children managed for epilepsy at the Paediatric Neurology Clinic of NHA over a period of five years(August 2009 to July 2013) were retrieved and relevant socio-demographic and clinical information extracted and retrospectively analyzed.*

Results: *226 subjects met the criteria for inclusion and were analyzed. The children were between the ages of 1 month to 17years. 157(69.5%) were male. 155(68.6%) were of upper social class. 32(14.2%) patients had positive family history of seizure disorder. 207(91.6%) were diagnosed of generalized seizure. Of the etiology of the seizure; in majority, no factor was identified while brain anoxia and brain infection were the commonest identified causes. 219(96.9%) patients showed abnormal EEG recording while in 75(33.2%) had brain MRI abnormality.160(70.8) patients had AED switched to a different anticonvulsant for various reasons. 41(18.1%) patients had there drug changed once, 2(0.9%) patients had drug switched twice, while 117(51.8%) had drug substituted more than twice. 33(14.6%) patients are on AED polytherapy. 31(13.7%) patients had been seizure free for more than two years.*

Conclusions: *The study reviews the pattern of occurrence of epilepsy in NHA. Two common etiologies identified were brain anoxia and brain infection. Majority of the patients were observed to have intractable seizure which calls for a need to review the factors that favor poor control in the subjects.*

Keywords- *childhood, epilepsy, seizure, etiology, intractable, EEG, brain imaging, AED – antiepileptic drugs.*

INTRODUCTION

Epilepsy is the most common childhood noninfectious neurological disorder affecting all races and social class.([1]-[2]) Epilepsy describes a condition of susceptibility to recurrent seizure. Seizure is defined as sudden and simultaneous discharge of brain neurons which leads to alteration of consciousness, motor activity, behavior, sensation and autonomic function.[3] Epilepsy is a major public health problem particularly in developing countries like Nigeria with limited health care facility to provide treatment for the sufferers.[1], [3] More than 50 million people suffer from epilepsy worldwide and 75 percent of these sufferers are in resource poor countries with little access to healthcare(.[4]-[5]) The estimated prevalence varies remarkably across the world between a low value of 2 per 1000 in the Marians Island to a high value of 37 per 1000 in Nigeria.[6] The variation has been related to varying methodology used to identify cases in these regions.

In Nigeria, the burden of epilepsy is further influenced by the sociocultural belief to the causation of epilepsy.[1] Many sufferers are kept away in locked door by relative to avoid being stigmatized or ostracized. The belief that epilepsy result from visitation of the devil, effect of witchcraft, the revenge of an aggrieved ancestral spirit or consumption of something harmful in utero is held in many communities in Nigeria. Many still believe that the disease is infectious and as such sufferers are avoided.[1] The effect of the sociocultural belief further influences effective community base study in Nigeria which has resulted in reliance on hospital studies in describing the pattern of epilepsies in Nigeria.

This work aims describe the pattern; demographic data, types of epilepsy, aetiology, treatment, and prognosis in recent years to give an overview of epilepsy in children a multiethnic centre of Nigeria.

SUBJECTS AND METHODS

This study was conducted in National Hospital Abuja, a tertiary care center located in the capital city of Nigeria. Children with neurological disorder are seen in the Paediatric Neurology Clinic every Thursday and an average of 40 patients is seen every week. The study was a retrospective study over the period of five years from August 2009 to July 2013. Ethical approval was obtained from the Hospital Ethical Committee for the survey. Inclusion criteria include every child diagnosed of seizure disorder who had attended the clinic under the study period. Those excluded from the study are those who were referred on account of first single episode of seizures, those with febrile seizures, missing folders or those with insufficient

information and those who had not performed EEG and brain MRI. Folders of patient seen in the clinic for seizure disorder were retrieved from the hospital record library and information relating to patient bio data, socioeconomic status (by Oyediji) [7], clinical type of seizure, family history of seizure, cause of the seizure, the electroencephalogram (EEG) and Brain Magnetic resonance imaging (MRI) finding, the type of anticonvulsant used as well as the response to treatment. Data was analyzed with student statistical package for students (SPSS) version 16 and reported in Proportion, %,

RESULTS

A total of 34,357 children were seen in the hospital during the period of the study, out of which 461 (1.34%) were referred to the Paediatric Neurological Clinic for seizure disorder. 0f the 235 Patients excluded from the study, 81 patient information were missing, 62 patient had incomplete information, 12 had a single episode of seizure and 80 patient had not performed both EEG and brain imaging studies. 226 patient met the criteria for inclusion and were analyzed.

Regarding the age distribution, 12 (5.3%) patients were infants. 45 (19.9%) patients were toddlers, 33 (14.6%) patients were of preschool age, 56 (24.8%) patients were of the age range of 6-9 years and adolescent between the ages of 10 to 17 years were 80 patients (35.4%) as illustrated in table 1.

Table 1: Demographic Data of The Study Population

AGE GROUPS	n	%
≤1 yrs	12	5.3
>1-3 yrs	45	19.9
4-5 yrs	33	14.6
6-9 yrs	56	24.8
10-17 yrs	80	35.4
SEX		
male	157	69.5
female	69	30.5
SOCIOECONOMIC STATUS		
upper social class(I, II & III)	155	68.6
lower social class(IV & V)	71	31.4

Male patients were 157 (69.5%) in number while the female patients were 69 (30.5%).The socioeconomic distribution in table 1 showed that 155 (68.6%) patient were of upper social class while 71 (31.4%) patients were of the lower social class. Only 32 (14.2%) patients had positive family history of seizure disorder.

Regarding the seizure types, 207 (91.6%) patients were diagnosed of generalized seizure while 19 (8.4%) patients had focal seizures. Of the etiology

of the seizure, 31 patients had neonatal brain anoxia, 30 patients had past brain infection, 108 patients classified as idiopathic had no etiology identified and 8 patients categorized as cryptogenic seizure had associated mental retardation or ADHD with no identified etiology. Other contributing causes such as structural brain disorder, post DPT, post trauma, tuberous sclerosis, prematurity, bilirubin induced neurological damage and neonatal hypoglycemia are illustrated in table 2.

Out of the 226 patients, 219 (96.9%) patients showed abnormal EEG while 7(3.1%) patients had normal EEG readings. The distribution of the abnormal EEG is shown in Table 2.

Table 2: Showing The Clinical Types, Causes And Investigation Findings Of The Study Population.

TYPE OF EPILEPSY	n	%
Genertalized	207	91.6
focal	19	8.4
ETIOLOGY OF SEIZURES		
Structural Brain Disorder	10	4.4
Post Perinatal Brain Anoxia	31	13.7
Brain Infection		
Post Mennigitis And Encephalitis	30	13.2
TORCHs	1	0.4
Post DPT Immunization	2	0.9
Post CVA SCA	6	2.7
Tuberous Sclerosis	2	0.9
Prematurity	3	1.3
Post Trauma	18	8
Bilirubin neurological damage	5	2.2
Hypoglycaemia	2	0.9
Cryptogenic	8	3.5
Idiopathic	108	47.8
EEG Finding		
normal	7	3.1
abnormal		
focal	203	89.8
generalized	16	7.1
Brain MRI Finding		
normal	151	66.8
Abnormal	75	33.2

The study showed that 151(66.8%) patients had normal brain MRI findings, while in 75 (33.2%) patients, abnormality was detected in the brain MRI.Regarding the choice of the first anticonvulsant the patients received, the study showed that 162 (71.7%) patients received Carbamazepine, 22 (9.7%) patients received Clonazepam, 19 (8.4%) patients received Valproic acid, 15 (6.6%) patients received Phenobarbital, 6(2.6%) patient received Phenytoin.

Table 3: Showing the Anticonvulsant Usage And Response To Treatment

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1st anticonvulsant medication used by patients	n	%
carbamazepine	162	71.7
Clonazepam	22	9.7
Ethusumide	2	0.9
Phenobarbitone	15	6.6
Phenytoin	6	2.7
Sodium Vaproate	19	8.4
No of Patients who had switched medication		
Never	66	29.2
Yes	160	70.8
Once only	41	18.1
Twice only	2	0.9
>Twice	117	51.8
No of Patient on anticonvulsant polytherapy	33	14.6
No of patient without active seizure for two years	31	13.7

160 (70.8) patients had been switched to a different anticonvulsant due to poor seizure control, intolerance to complication of the anticonvulsants or lack of fund to sustain anticonvulsant, while 66(29.2%) patients had maintained the first anticonvulsant since commencement of therapy. 41(18.1%) patients had there drug changed once, 2(0.9%) patients had drug switched twice, while 117(51.8%) had drug substituted more than twice. Of the 226 patients, 33(14.6%) patients are on antiepileptic polytherapy.

Out of the 226 patients, 31 (13.7%) patients had been seizure free for more than two years.

DISCUSSION

Childhood epilepsy is a common problem encountered in Paediatric practice in our environment. The study has established the prevalence of childhood epilepsy in children age 1 month to 17 years in National Hospital Abuja. The prevalence of childhood epilepsy was found to be 6.5 per 1000. Based on studies conducted in other regions in Nigeria, the overall prevalence range of 5.3% to 37% has been documented.[3], ([8]-[11])

The study reports an increase prevalence of epilepsy with age which is in keeping to similar findings from the survey conducted in Nigeria.[1],[3], [8],[9] Male preponderance of childhood epilepsy was observed with a sex ratio of 2.3:1 which is similar to the finding from other studies.[1], ([12]- [16]) This may be attributed to the much care for the male child than the female counterpart in Africa or a reflection of the tendencies of male child toward activities with increases risk leading to head injury.

Various studies [1], ([17]-[21]) had expressed the occurrence of epilepsy in the lower social class in higher frequencies than in the upper social class. This study reported rather an increase occurrence in the upper socioeconomic class. The reason may be attributed to the methodology of selecting patient that excludes those who had not performed brain imaging studies and EEG, majority likely to be of the lower socioeconomic class who could not afford the investigation since it was paid out of pocket.

The report that a positive family history of epilepsy can be elicited in 19.3% to 81% of patients has been documented in other studies. ([22]-[23]) However; a low value of 14.2% was obtained in the study. Perhaps the reason may be that a large proportion of these patients had symptomatic epilepsy. Reports have shown symptomatic or secondary epilepsies are very common in the developing countries. [24] Saqid et al [25] reported a positive family history in 20% of Sudanese adolescence. On the contrary, Jilek-Aall et al[26] reported 76.6% of patients with epilepsy among adolescence in Bantu, a tribe in Tanzania had positive family history.

Regarding the pattern of Epilepsy, majority had generalized seizure as against the focal seizure. The finding is similar to what has been reported in the literature from other Africa countries.[21],[25],([27]-[29]) it is believed that generalized seizures are the most dramatic in presentation, so family of affected individual are interested to seek for medical treatment to avoid being stigmatized unlike the focal seizure which may go unnoticed especially in developing countries.[25] There are however some literature[30]), [31] which has reported higher frequency of partial seizure in the developing countries than the generalized seizure. The reports attribute their finding to the higher occurrence of symptomatic epilepsy resulting from secondary factors in the tropic.

The study showed that in majority of the patients, the etiology was not identified which is consistent with other published article on epilepsy from Africa. The three major risk factors identified from this study includes: brain anoxia from perinatal asphyxia, brain infection and traumatic brain injury. Others

include- structural brain disorder (such as brain tumors, brain cyst, hydrocephalus etc.), congenital infection, post DPT immunization, post cerebrovascular accident, prematurity and tuberous sclerosis. Brain anoxia was the commonest of the symptomatic epilepsy as against brain infection which has been documented in other studies from Africa as the commonest. Although a significantly high proportion of epileptic patient were identified to have resulted from brain infection from this study. Ogunlesi et al[21] in a similar review of the pattern of childhood epilepsies in Sagumu identified birth asphyxia as the commonest cause of symptomatic epilepsy. This may be indicative of a changing trend due to advancement of immunization services as well as other preventive program in curtailing the spread of meningitis. Some may however argue that improve perinatal services may have accounted for a reduction of the mortality of asphyxiated babies in the tropics who are now surviving with sequelae of the brain injury.

Abnormal EEG recording was obtained in 96.9% of patient in our studies. Osuntokun et al[32] reported 70% of 560 patients had abnormal EEG, while in a study by Danesi et al[33] in Lagos, 100% abnormal EEG recording was obtained. These values are higher than those from western world with most finding of 50%.([34],[35]) Although the EEG procedure in National Hospital Abuja included the Standard activation procedures of hyperventilation (up to three minutes) and photic stimulation (using published protocols) which has been documented to improving the yield of interictal EEG.[35] Aina et al(34) further considered that high interictal EEG in African children may be due a higher risk of experiencing brain damage early in life when compared with their western counterparts.

The diagnostic relevance of brain imaging in the investigation of an epileptic patient was identified by the study in that [33]

.2% of the patients had abnormal brain MRI or CT. In a study by Chaurasia et al[36], abnormalities in MRI were detected in about 70.4% of 271 children with epilepsy. This goes to support for the need to perform brain imaging routinely for all patient with epilepsy.

Several first generation antiepileptic drugs (AED) – Carbamazepine, Clonazepam, Phenytoin, Phenobarbital, Ethosuximide and Vaproic acid are used as first line in the clinic. Several factors which include patient profile, seizure type, etiology, socioeconomic status, pharmacokinetic of the AED, cost etc. determine the choice of AED to be prescribed.[37] Carbamazepine is the most widely used AED in the management of seizure disorder in National Hospital Abuja. Carbamazepine has gained wide acceptance due to it favorable anticonvulsant efficacy and supplementary psychotropic effect.[38] Children may however present the side effect of carbamazepine which includes dizziness, drowsiness, unsteadiness, nausea, vomiting, Steven Johnson rash, aplastic anemia etc. especially early in therapy [39] Carbamazepine has demonstrated efficiency for a wide range of seizure that includes simple partial seizure, complex partial seizure, generalized tonic clonic seizure, partial seizure with secondary generalization.[40] However it is

ineffective for absence seizure, myoclonic seizure and atonic seizures.[41] The WHO recommends the use of phenobarbital in the developing countries[42] but the usage is very little in National Hospital Abuja due to its ability to alter mood, cognition and behavior. It affects memory and learning, which are key aspects of child's development. It also affects bone mineralization impairing growth.[43] Furthermore; there is a higher frequency of adverse drug reaction (ADR) withdrawal reported amongst epileptics' patient on phenobarbital.[44]

The study reported that 70.8% patient had switch AED for various reason which includes poor seizure control, intolerance to drug side effect and poor drug compliance due to cost of sustaining therapy. 51.8% of the epileptic patients are categorized as having intractable epilepsy which is defined as having failed two AED therapies. This figure is remarkably higher than epidemiological data that indicate 20-40% of patients having intractable seizure.[45] In a study to determine the predictor of intractable seizure by Malik et al[46], factors identified includes male sex, neonatal seizure, more than 10 seizure before onset of antiepileptic, myoclonic seizure, status epilepticus and symptomatic epilepsy. The factors are observed in the patients and may have contributed to the high frequency of patient with intractable seizures.

Regarding the proportion of patient who had achieved 2 years of remission or seizure free interval, 13.7% was reported. This is lower than report from western literature. Perhaps the reason may also be linked to the factors associated with intractable seizures.

CONCLUSION

Childhood epilepsy is a common occurrence in our environment and the prevalence of 6.5 per 1000 is reported which signify a slightly lower frequency obtained in other region in the country. Majority of the epilepsy are generalized type. Of the known causes three major risk factors include brain anoxia from perinatal asphyxia, brain infection and traumatic brain injury. EEG and brain imaging are essential tool for diagnosis of epilepsy with high level of detecting abnormalities. Carmazepine is most frequently prescribed for seizure patient in National Hospital Abuja. The proportion on patient with intractable seizure is high and calls for need to determine the predictor for our environment.

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