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Original Article

Profile of People with Epilepsy seen at a Tertiary Hospital in North-West Nigeria

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ABSTRACT

Epilepsy is one of the most prevalent chronic non-communicable neurological disorder. Persons with epilepsy (PWE) have unique characteristics that have social impacts on the affected individuals and their family. This study sought to describe the profile of patients with epilepsy attending the out-patient neurology clinic in a tertiary health care centre in North West Nigeria. The study was carried out at Neurology clinic of Ahmadu Bello University Teaching Hospital Kaduna State, Nigeria from August 2013 to October 2014. Consecutively presenting PWE on follow-up were recruited after obtaining ethical approval and informed consent. Those recruited were at least 18 years and have been on routine follow-up for at least 1 year. Patients with clinical and electroencephalography (EEG) features suggestive of non-epileptic seizures, acute metabolic or febrile illness precipitating seizures were excluded. A structured questionnaire was used to obtain all relevant information. The data was analyzed using SPSS version 17 with p-value set at less than 0.05. A total of 103 PWE were recruited with median age of 29 years. More than 50% were in the 21-30 years age group. About 55.3% were single (never married), 58.2% were unemployed and earned < ₦50,000.00 monthly income. The median age of onset of epilepsy was 20 years, while median duration of illness was 7 years. About 50.5% were focal seizures, with traumatic head injury (14.6%) and febrile convulsion (12.6%) as aetiological factors, while 52.5% of them had no identifiable aetiological factor. About 96% were on antiepileptic drug monotherapy, 82% of them on carbamazepine only for a median duration of 7.5 years. Our study shows that epilepsy is predominant among the young population, who are mostly single (never married), unemployed, with poor monthly income occurring more as focal seizure type, with majority of them on carbamazepine monotherapy. There is the need for public enlightenment campaign and effort targeted at mitigating the prevalence of the disease among the young and productive population.

Keywords: *North West Nigeria, People with epilepsy, Profile, Social impacts*

INTRODUCTION

Epilepsy is a common chronic non-communicable medical condition or group of disorders of the brain with unique characteristics social impacts on the affected individuals and their family; and it is prevalent is sub-Saharan Africa including Nigeria.[1,2] Epilepsy accounts for 0.5% of the global burden of disease, a time-based measure that combines years of life lost due to premature mortality and time lived in less than full health.[3] About 85 % of the burden of the disease is in the developing world, where over 60% of the people with epilepsy (PWE) receive no treatment at all.[4] Although many underlying disease mechanisms can lead to epilepsy, the cause of the disease is still unknown in about 50% of cases globally.[3] The causes of epilepsy are divided into the following categories: structural, genetic, infectious, metabolic, immune and unknown. [3,5]

Currently International League Against Epilepsy (ILAE) defined epilepsy as disease of the brain characterized by at least two unprovoked (or reflex) seizures occurring more than 24 hours apart or one unprovoked (or reflex) seizure and a probability of at least 60% of having further seizures over the next 10 years or a diagnosis of an epilepsy syndrome.[6] Epilepsy leads to multiple interacting medical, psychological, economic and social repercussions, all of which must be considered in order to understand fully the impact of this condition. The disorder has significant economic implications in terms of health-care needs, premature death and lost work productivity. [3] Although the social effects of epilepsy may vary from country to country and culture to culture, but it is clear that all over the world the social consequences are often more difficult to overcome than the seizures themselves.[3] People living with epilepsy can be targets of prejudice and the stigma and or discrimination associated with the disease can discourage people from seeking treatment so as to avoid becoming identified with the illness.[3]

In many developing countries, including Nigeria, there is a general misconception or misunderstanding and negative attitude towards PWE [7,8,9] Majority of people are afraid of interacting with PWE as they feel the disease is contagious and the patients are sometimes left unattended to during seizure episodes resulting in injuries and burns.[7, 10] PWE feel socially isolated with poor social adaptation due to perceived stigma with resultant low self-esteem[11] There is stress on the family due to the illness with higher rate of separation or divorce[11] Nigerian patients with epilepsy as in other climes suffer social deprivation, discrimination and stigmatization in education, employment, housing and marital life amongst other components of daily living.[7,8,12]

This study sought to describe the profile of patients with epilepsy attending the out-patient neurology clinic in a tertiary health care centre in North West Nigeria. We hope the finding in this study will help policy makers and clinicians caring for PWE. It is also anticipated to serve as a tool for enlightenment campaigns about the disease and to be utilized in the advocacy for persons with epilepsy.

MATERIALS AND METHODS

Setting: This study was conducted at the Epilepsy Outpatient Clinic of Ahmadu Bello University Teaching Hospital (ABUTH), Zaria, from August 2013 to October 2014. ABUTH is located in Zaria, Kaduna state, North West, Nigeria and receives referrals from the three geo-political zones of Northern Nigeria including the Federal Capital Territory (FCT). This study was carried out from August 2013 to October 2014.

Study design: This was a descriptive cross-sectional hospital-based study.

Ethical consideration: Ethical approval was obtained from Health Research Ethical Committee (HREC) of the institution before commencement of the study. Informed consent was obtained from all participants in this study with confidentiality of all data acquired ensured.

Data collection: Consecutively presenting adult PWE diagnosed by the Neurologists were recruited after obtaining informed consent from them. Epilepsy was diagnosed based on history of at least two unprovoked

seizures 24 hours apart corroborated by an eye witness account with supportive abnormal inter-ictal EEG.[1,13] Epilepsy was classified according the 2017 ILAE classification.[14]

Those recruited were at least 18 years and have been on routine follow-up for at least 1 year. Patients with clinical and EEG features suggestive of non-epileptic seizures, acute metabolic or febrile illness precipitating seizures were excluded. A structured questionnaire was used to obtain information regarding socio-demographic characteristics and clinical characteristics including history of antiepileptic drug (AED) usage. Electroencephalography was performed for all the patients while brain magnetic resonance imaging (MRI) or computed tomography scan (CT scan) was done for 41 of the participants who could afford to pay for brain imaging.

Data analysis: Data entry and statistical analysis was done using the statistical package for social sciences (SPSS) software (version 17; SPSS, Chicago, IL, USA). Descriptive statistics was used to compute range and median for quantitative variables as well as frequencies. Chi-square test statistic ($\chi 2$) was used to test relationship between categorical variables. A p-value of less than 0.05 was used to determine statistical significance.

RESULTS

Socio-demographic Characteristics of Persons with Epilepsy

A total of 103 PWE were recruited for the study with median age of 29 years. The commonest age group affected were within 21-30 years 36, (35.0%) with about 57.3% of them aged 30 years and below. Sex distribution shows fifty-four males (52.4%) and forty-nine females (47.6%). Majority of the patients were single (never married) 57, (55.3%). Other details are shown in Table 1 below.

Table 1: Sociodemographic distribution of Persons with Epilepsy

Variable	Frequency; n = 103	Percentage
Mean age (SD) Years	33.4 (15.8)	
Median age	29	
Age range	18 -75	
Age group in years		
18 -20	23	22.3
21 -30	36	35.0
31 -40	18	17.5
41 -50	9	8.7
51 -60	9	8.7
61 -70	7	6.8
71 -80	1	1.0
Sex		
Male	54	52.4
Female	49	47.6
Marital status		
Single (Never married)	57	55.3
Married	39	37.9
Separated/divorced	6	5.8
Widowed	1	1.0
Educational Status		
No formal	21	20.4
Primary	15	14.6
Secondary	25	24.3
Tertiary	42	40.8
Occupational Status		
Employed	43	41.8
Unemployed	60	58.2
Income		
< ₦50,000	60	58.2
≥ ₦50,000	12	11.7
*None	31	30.1

*% = Percentage; * = Patients with no sources of income (mostly students)*

Clinical Characteristics of Persons with Epilepsy

In this study, the median age of onset of epilepsy was 20 years while the median duration of the illness was 7 years. Fifty-two (50.5%) patients had focal seizure while fifty-one (49.5%) had generalized forms. Of these, 46 patients (44.7%) had generalized tonic clonic seizure (primarily generalized tonic clonic); followed by focal with impaired awareness (complex partial) in 33 (32.0%) patients. Focal with bilateral tonic clonic (focal with secondarily generalized) was diagnosed in 18 (17.5%) patients;

generalized atonic (atonic) seizure in 5 (4.8 %); and focal aware (simple partial) seizure in 1 (1.0%). The number of patients with positive family history of seizure disorder (10, 9.7%) were about 9 times less than those (93, 90.3%) without family history with a significance difference of (χ^2 = 66.88, p = 0.0005). About 34 (33.0%) experiences their seizure in the day; 31 (30.1%) has nocturnal seizures while 38 (36.9%) experiences both in the daytime and at night.

Most of the patients (60, 58.3%) were seizure free in the past 4 weeks; 32 (31.1%) had 1-3 episodes of seizures; 4 (3.9%) had 4-7 episodes and 7 (6.8%) had ≥ 8 seizure episodes. Neurological examination was abnormal in 8 (7.7%) and normal in 95 (92.3%) patients with a significant difference of (χ^2 = 73.48, p = 0.0005). Abnormal findings included: hemiparesis (3, 2.9%), facial nerve palsy (2, 1.9%) and extensor plantar reflex (3, 2.9%). Abnormal EEG findings in the form of focal spike/sharp and slow wave as well as generalized spike/sharp and slow wave were found in 87 (84.5%) of patients, while the EEG was normal in 16 (15.5%) with a significant difference of (χ^2 = 48.94, p = 0.0005). Brain neuroimaging (MRI/CT Scan) was done by 41 (39.8%) of the patients in this study while 63 (60.2%) did not, out of which 21 (20.4%) revealed abnormal findings in contrast to normal findings in 20 (19.4%) patients (χ^2= 0.024, p = 0.876). Abnormal findings included brain infarction in 10 (9.7%), brain atrophy in 10 (9.7%) and brain tumuor in 1 (1.0%).

Table 2: Clinical Characteristics of Persons with Epilepsy

Variable	Frequency; n = 103	Percentage
Median Age at onset of illness in years	20.0	
Median Duration of illness in years	7.0	
Seizure Type		
Focal aware	1	1.0
Focal impaired awareness	33	32.0
Focal to bilateral tonic clonic	18	17.5
Generalized tonic clonic	46	44.7
Generalized atonic	5	4.8
Family history of Seizure		
Family history present	10	9.7
Family history absent	93	90.3
Time of Seizure Occurrence		
Day	34	33.0
Night	31	30.1
Both	38	36.9
Seizure Frequency in Past 4 Weeks		
≤ 1	60	58.3
2 - 3	32	31.1
4 - 7	4	3.9
≥ 8	7	6.8
Neurological Finding		
Normal	95	92.2
Abnormal	8	7.8
EEG Finding		
Normal	16	15.5
Abnormal	87	84.5
Neuroimaging Finding		
Normal	20	19.4
Abnormal	21	20.4
Not done	62	60.2

n = Number; EEG = Electroencephalography

The risk factors for epilepsy identified from history in this study included: head injury (15, 14.6%), febrile convulsion (13, 12.6%), stroke (7, 6.8%), CNS infections like meningitis and encephalitis (6, 5.8%) and post eclampsia (5, 4.8%) and birth trauma (3, 2.9%) respectively. However, there was no identifiable risk factors in (54, 52.5%) of the patients. There was no significant difference observed between the number of patients with risk factors and those without risk factors (χ^2= 0.243, p= 0.622).

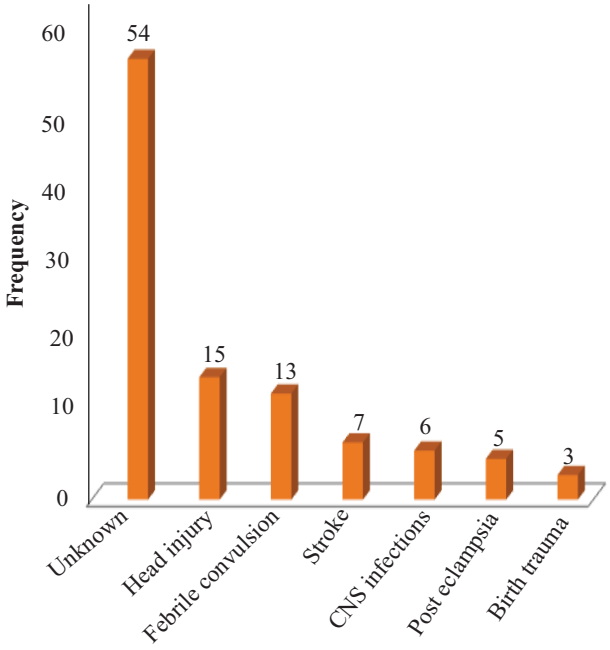

Figure 1: Risk Factors for Epilepsy

Antiepileptic drug usage by Persons with Epilepsy

All the patients were on AED(s) at the time of evaluation for the study. The median duration of AED(s) use was 7.5 years. Significant number (99, 96.1%) of the patients were on mono-therapy and (4, 3.9%) were on poly-therapy (χ^2 = 87.62, p = 0.0005). Similarly, (85, 82.5%) patients were on carbamazepine, (7, 6.8%) each were on sodium valproate and phenytoin, (2, 1.9%) were on carbamazepine plus sodium valproate, and (1, 1.0 %) patient each was on sodium valproate plus phenytoin and sodium valproate plus levetiracetam.

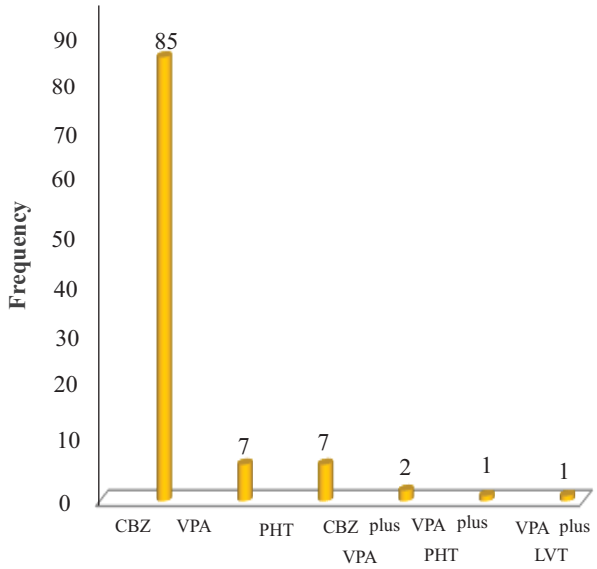

Figure 2: Pattern of antiepileptic drugs used by patients

Key: CBZ = Carbamazepine, VPA = Valproate, PHT = Phenytoin, LVT = Levetircaetam

About 80 (79.6%) of the patients were adherent to their AED(s), while 21 (20.4%) were not for the reasons shown in Table 3 below. Reasons given by those who were non-adherent included: forgets to take medications, 22 (41.5%); medication side effects, 8, (15.1%); lack of money, 8 (15.1%); feels well and does not need medication, 8 (15.1%) and prohibitive cost of AED(s), 7 (13.2%).

Table 3: Reasons for AED(s) Non Adherence by Persons with Epilepsy

	* Frequency	Percentage
Forgets to take medications	22	41.5
Medication side effects	8	15.1
Lack of money	8	15.1
Feels well and does not need AED	8	15.1
Prohibitive cost of AED(s)	7	13.2

*AED(s) = Antiepileptic drug(s), * = Multiple Responses*

Regarding the presence of AED(s) side effects, 25 (24.3%) patients experienced various forms of side effects which included: double vision (24, 18.2%), dizziness (23, 17.4%), excessive sleep/drowsiness (23, 17.4%), decreased energy (18, 13.6%), memory impairment /forgetfulness (14, 10.6%), blurred vision (12, 9.1%), tremors (6, 4.5%), confusion (6, 4.5%), nausea (4, 3.0%), and gum hyperplasia (2, 1.5%). These patients were significantly fewer than the 78 (75.7%) patients who did not experience any side effects ($\chi^2 = 27.27$, $p = 0.0005$). Details are shown in Table 4 below.

Table 4: Antiepileptic Drug(s) Side Effects Experienced by Persons with Epilepsy

AED(s) Side Effects	*Frequency	Percentage
Double vision	24	18.2
Dizziness	23	17.4
Excessive sleep/drowsiness	23	17.4
Decreased energy	18	13.6
Memory impairment/forgetfulness	14	10.6
Blurred vision	12	9.1
Tremors	6	4.6
Confusion	6	4.6
Nausea	4	3.0
Gum hyperplasia	2	1.5

*AED(s) = Antiepileptic drug(s), * = Multiple Responses*

DISCUSSION

The present study which was carried out in a major epilepsy referral centre in North West Nigeria shows that majority of the patients were young. This observation is in line with the report of WHO, that the disease is common among children and adolescence.[15] Other studies by Ohaeri *et al*., Kinyanjui *et al*., Ogunrin *et al*., and Iwuozo *et al*, also reported similar trend in young people.[16, 17, 18, 19] This could be attributable to the prevalence of risk factors for epilepsy that occurs commonly in childhood or young people like traumatic brain injury, recurrent febrile convulsions and CNS infections like meningitis and encephalitis found to be 14.6%, 12.6% and 5.8% respectively in this study. The present study showed a slight male preponderance, 52.4%; more than half of the participants were single (never married), 55.3%; high proportions of unemployed PWE, 58.2% and large number of them earned < ₦50,000.00 per month, 58.2%. This is consistent with earlier studies that revealed similar trend. [14-17] However contrary to previous reports that has shown low level of educational attainment among PWE, in our cohort about 40.8% of them had tertiary educational status.[18,20-22] This may not be unconnected to the location of the study which is a major educational town with several institutions of higher learning.

This study showed that 50.5% of PWE had focal form of seizures. Several previous studies in both children and adults with epilepsy had documented predominance of focal seizures.[21-23] These studies like ours utilized the clinical history supported by EEG finding in the seizure classification. About 9.7% of our cohorts in this study had positive family history of seizure disorder. A study by Ottman *et a*l in USA who assessed the accuracy of family history information on epilepsy and other seizure disorders reported 83% sensitivity of family history of epilepsy in offspring and siblings of PWE. [24] In epilepsy as in many disorders family history information is very important clinically; it can guide diagnosis, help to evaluate the need for additional diagnostic tests (including genetic tests), and inform risk assessment for genetic counselling. It is also important for genetic research. [24]

About 7.7% of PWE in our study had abnormal neurological examination finding. Usually most PWE have normal neurological examination findings except in cases with aetiological risk factors like stroke and severe birth trauma resulting in cerebral palsy. In this study, 39.8% of our study participants were able to carry out brain neuroimaging (Brain MRI/CT Scan). Among these PWE, 20.4% had abnormal neuroimaging finding; two common abnormality found were brain infarction and cerebral atrophy in 9.7% each. The low rate of neuroimaging could be attributable to the prohibitive cost in our environmental as well as the poor economic power of most sufferers of the illness. In contrast to this study, Ogunniyi *et a*l evaluated the CT scan findings in 75

Nigerians with epilepsy and found that the CT was abnormal in 45.3% of them.[25] The most common abnormality was cortical atrophy seen in 21.3%, followed by space occupying lesions (17.3%), vascular lesions (5.3%) and porencephaly (1.3%). They also noted that all the patients with neurologic deficit (namely hemiparesis with cranial neuropathy) had abnormal CT scan findings.

EEG is still the most important tool in evaluating PWE.[26] It helps alongside the clinical history to confirm the diagnosis of epilepsy and assists in classification.[26] Abnormal EEG was detected in 84.5% of our cohort of PWE. Owolabi *et al* in Kano, North-Western Nigeria reported abnormal EEG in 57.7% of them. [13] The present study showed that no identifiable aetiological risk factor for epilepsy was found from history in 54.0% of PWE similar to WHO global report that gave a rate of about 50%.[3] However, an earlier study by Obiako et al documented a rate of 67.8%.[27] The present study also found a few proportions of PWE (4.8%) who reported eclampsia as the risk factor for their epilepsy. Eclampsia is said to be associated with significant life- threatening complications and can predispose to epilepsy and cognitive impairment later in life. [28]

The goal of epilepsy treatment is to achieve a seizure free status with little or no adverse effects. All the patients in this study were on AEDs with 96.1% of them on monotherapy (carbamazepine or valproate). Monotherapy is often preferred to polytherapy because it is cheaper and there is also decreased likelihood of drug-drug interactions, enzyme induction and/or inhibition that is normally associated with concomitantly administered AED. This tends to reduce the serum level and/or necessitate increasing the dose for optimal effect, but causing more adverse effects.[29] This study found that majority (82.5%) of the patients were using carbamazepine more than sodium valproate (6.8%) or phenytoin (6.8%) and which is a deviation from the advocacy of WHO that phenobarbitone be used as first line drug for cost effective reasons.[30] Previous investigators had showed that treatment option is no longer based on cost consideration alone and that most clinicians hardly ever prescribe phenobarbitone but prefer carbamazepine.[31, 32] Equally, recent studies also reported carbamazepine to be more frequently used than other AEDs. [22,33] Thus, the shift in treatment option of the choice of the AED may have been based on the seizure type or epileptic syndrome and also for the fact that carbamazepine is the preferred first line drug for focal as well as focal with secondarily generalized seizures which many of the follow up patients on AEDs in this study presented with, and which may have necessitated the frequency of its usage. In addition, carbamazepine has mood stabilizing properties and has been found to be very useful in the control of behavioural symptoms in the setting of epilepsy care which could have made it a preferred choice.[33] Valproate is often used to a lesser extent for the treatment of partial seizures and most times as adjunct with other AEDs, but it is the AED of choice for primarily generalized epilepsies of idiopathic origin and for myoclonus types of epilepsies especially the Juvenile myoclonic epilepsy (JME). Thus, not being frequently prescribed might be because of the reduced number of these types of seizures in the study and/or its frequent clinical experience of severe sedation or even coma probably from its hyperammonemia side effect. It also causes endocrine adverse effects including insulin resistance that results in hyperglycaemia and change in sex hormone levels that results in anovulatory cycles, amenorrhea, and polycystic ovary syndromes. [34]

The rate of adherence to AEDs from our study was 79.6%, although this was similar to a previous study that reported 77.4%.[22] There is the need for regular adherence counselling for PWE during their routine out-patient clinic. Also, caregivers of PWE will need constant health education and counselling about the illness to enable them support the patients by reminding them to take their AEDs so as to enhance adherence and ultimately good seizure control with resultant improved health related quality of life.

CONCLUSION

Epilepsy is a major public health problem and our study has shown that it is predominant among the young

population, who are mostly single (never married), unemployed, with poor monthly income occurring more as focal seizure type, with majority of them on carbamazepine monotherapy. There is the need for public enlightenment campaign and effort targeted at mitigating the prevalence of the disease among the young and productive population.

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Conflict of Interest

The authors declare no conflict of interest.

Authors' Contributions

'Author EUI' designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. 'Author ROO' and 'Author AO' revised the manuscript to give it intellectual content while 'Author MO' edited the first draft of the manuscript. All authors read and approved the final manuscript.

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