

CLINICAL PROFILE OF PATIENTS WITH EPILEPSY IN DEVELOPING COUNTRIES:  
EXPERIENCE AT KANO, NORTH WESTERN NIGERIA

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#### ABSTRACT

#### INTRODUCTION

Throughout the world epilepsy is a major neurologic disease with considerable personal and social impact. It constitutes the commonest non-infectious disease of the nervous system that brings the Africans to the hospital. The present study set out to describe the clinical profile of epilepsy in Kano, Northwestern Nigeria.

#### MATERIALS AND METHODS

The present study was based on the systematic study of consecutive epileptic patients seen at the adult Neurology Clinic of Aminu Kano Teaching Hospital and Murtala Specialist Hospital Kano over a period of 3 years. Data was collected using a structured questionnaire, which was pretested for clarity, and it was administered by a neurologist and resident doctors, EEGs were obtained and neuroimaging was done where necessary. Analysis of data was done using a statistical software package SPSS version16.

## RESULTS

Two hundred and ten patients comprising one hundred and twenty four (59 %) males and eighty six (41%) females were studied. The median age of the male patients was 34 years (range: 17 -77 years) and the median age of the female patients was 35 years (range: 14 -85 years). Eighty eight (41.9%) of the patients had complex partial seizures while eighty three (39.5%) had primarily generalized tonic clonic seizures. The most common (55.6%) aura and automatism encountered in the patients with complex partial seizure were sensory, oro-alimentary respectively. Neurologic deficit was much more likely to be found in simple partial seizure compared to primarily generalized seizure with an odd ratio of 69.4

The most common etiological factors identified on neuroimaging were cerebral infarcts (4.8%) and tumors (3.3%). Abnormality on neuroimaging was much more likely to be found in simple partial seizure compared to primarily generalized seizure, odd ratio was 33.9. Abnormal EEG was recorded in 60% of the patients.

At presentation, 44.3 % were already on traditional or spiritual mode of treatment. Subsequently, all the patients had anticonvulsants, 55.7% had adequate seizure control. No mortality was recorded during the study period.

**Conclusion:** In our study, Complex partial and generalized tonic-clonic seizures appeared to be the most common epileptic seizure type seen in Kano. Cerebral infract and tumour appeared to be the most common etiologic factors among subset of patients with symptomatic seizure. Majority of the patients would have sought spiritual or traditional treatment before coming to the hospital stressing the need for education.

## INTRODUCTION

Epilepsy affects approximately 50 million people worldwide, with 80% of these individuals residing in developing regions<sup>1,2</sup>. Throughout the world epilepsy is a major neurologic disease with considerable personal and social impact. It constitutes the commonest noninfectious disease of the nervous system that brings the African to the hospital<sup>3</sup>.

Studies in rural areas of Africa<sup>4</sup> and South America<sup>5,6</sup> have revealed prevalence ratios much higher than the figures of 3-9/1,000 reported in developed countries<sup>7</sup>. However, despite appreciable number of studies on epilepsy in Nigeria, there are marked inequalities in the distribution of data generated and published in different regions of the country with a very noticeable paucity of literature on epilepsy in Northwestern Nigeria.

The present study was designed to describe the clinical and electroencephalography profile of epilepsy in Kano, Northwestern Nigeria.

## MATERIALS AND METHODS

The present study was based on the study of consecutive epileptic patients seen at the adult Neurology Clinic of Aminu Kano Teaching Hospital and Murtala Specialist Hospital Kano

Between January 2008 and December 2010.

The subjects, who must have had two or more afebrile seizures unrelated to an acute underlying defined cause and who must have been accompanied by an eyewitness such as a parent, spouse, or a close relative living with the patient, were enrolled consecutively. The historical details of the seizure patterns were obtained through interviews with each case and an accompanying relative, followed by physical and neurologic examination. The seizure patterns were classified on the basis of the clinical criteria used in the 1981 International Classification of Epileptic Seizures<sup>7</sup>

Electroencephalographic (EEG) recordings were available in some cases but were not a prerequisite for diagnosis. Where EEG recordings were done for patients, the recordings were obtained during the interictal

period using 32-channel Grass model EEG equipment. Electrode placement was by the 10-20 cap system. Features such as background a-rhythm, voltage symmetry, spikes, sharp waves, slow waves, and other paroxysmal discharges were observed. Patients with indications for neuroimaging like focal neurologic features, clinical features suggestive of intracranial events or space-occupying lesions etc, had neuroimaging (CT or MRI).

Data was collected using a structured questionnaire which was pretested for clarity and administered by a neurologist and resident doctors. The questionnaire assessed demographic data such as occupation and educational status, seizure type, frequency of seizure, antiepileptic drugs (AEDs) etc.

Seizure is said to be inadequately controlled if patient had attack despite appropriate medical therapy with at least 2 AEDs in maximally tolerated doses for 18 months–2 years or adequate seizure control with unacceptable drug-related side effects, or seizure in the past six month<sup>8</sup>.

Analysis of data was done using a statistical software package SPSS version 16.

## RESULTS

Two hundred and ten patients which comprised one hundred and twenty four (59 %) males and eighty six (41%) females were studied. The median age of the male patients was 34 years (range: 17 -77 years) and the median age of the female patients was 35 years (range: 14 -85 years) (Table 1). All the subjects had classifiable seizure types: Nineteen subjects (9%) had simple partial seizures, eighty eight (41.9%) had complex partial seizures, eighty three (39.5%) had primarily generalized tonic clonic seizures while seventeen (8.1%) had secondarily generalized seizures. Table 2 shows the distribution of seizure type by age group.

All the subjects (19) with simple partial seizure had motor manifestations. There was associated Todd's paralysis in five (2.4%) subjects and versive seizure in eight (3.8%) with simple partial seizure. Out of the eighty eight with complex partial, thirty eight (18.1%) had aura. The most common aura encountered was

sensory, in form of abnormal epigastric sensation present in twenty (55.6%) of such subjects (Table 2).

Thirty seven (25.3%) of the 88 subjects had automatism with oro-alimentary manifestation predominating in twenty nine (78.4%) of them (Table 3).

In general, 184 patients (87.6%) noted at least one specific seizure precipitant. More female patients (89.5%) than male patients (86.3%) identified at least one precipitant ( $p= 0.315$ ). In descending order, stress (53.3%), febrile illness (35.7%), missing AEDs (22.4%), 13.9%) hunger or fasting, heat, fatigue were cited as seizure precipitants. Caffeine (3.8%), alcohol (2.4%) and sleep (1%) were infrequently reported precipitants.

Seventeen (8.1%) of the subjects had family history of epilepsy, past history of meningitis and head injury were obtained in 2 (1%) subjects, thirty three (15.7 %) respectively, thirty five (16.7 %) had history of previous stroke.

Twenty eight had neurological deficit which included speech abnormalities, cranial nerve (7<sup>th</sup>, 6<sup>th</sup> and 3<sup>rd</sup>) palsy and focal motor neurologic deficits ; twelve out of nineteen (63.2%) of patients with simple partial seizure, two out of eighty three (2.4%) of those with generalized tonic clonic seizure type, two out of eighty eight (2.3%) with complex partial seizure and five out of seventeen patients with secondarily generalized had neurologic deficits. Neurologic deficit was much more likely to be found in simple partial seizure compared to primarily generalized seizure with an odd ratio of 69.4.

Among those with indications for neuroimaging who had neuroimaging the most common etiological factors identified were cerebral infarcts (4.8%) and tumors (3.3%) (Figure 1). Abnormality on neuroimaging was much more likely to be found in simple partial seizure compared to primarily generalized seizure, odd ratio was 33.9.

One hundred and three (49%) had interictal EEG out of which sixty two (60%) was abnormal.

At presentation, twenty five (11.9%) were already on traditional or spiritual mode of treatment, only seventy four (35.2%) were already on AEDs while sixty eight (32.4%) were on both. However, none had no good seizure control at presentation.

Following evaluation, all the patients had been placed on anticonvulsants, one hundred and eight (51.4%) patients had carbamazepine only, forty three (20.5) had valproate only, four (1.9%) had barbiturate only, fifteen (7.1%) were on combination of carbamazepine and valproate, five (2.3 %) had carbamazepine and barbiturate and only one (0.5%) patient had carbamazepine, valproate and barbiturate at the time of the study. With these medications one hundred and seventeen (55.7%) had adequate seizure control. No mortality was recorded during the study period.

## DISCUSSION

It should be noted that the cases of epilepsy included in this study were derived from a highly selected group as the study was hospital based, thus, the results of this study may not necessary be applicable to all cases of epilepsy in the larger community. However, the findings provide some clues as to the clinical profile of epilepsy in Kano.

The male preponderance in these study is similar to the findings in some community based studies amongst Africans and Asians<sup>9,10</sup>. This male preponderance has been attributed to the pattern of hospital attendance in this environment<sup>9</sup>, this may also be due to occupational and social exposure to epileptogenic insults, like head injury.

The high incidence of partial epileptic seizure in this study is in keeping with the finding of Danesi in his work on classification of epilepsies in Nigeria<sup>11</sup>. The high frequency of partial seizure type in this study like in most developing countries could be ascribed to high incidence of birth injury, CNS infections, and febrile convulsions<sup>11</sup>.

Complex partial seizure or epilepsy with complex symptomatology accounted for the largest seizure type in this series, this finding is comparable to those of previous studies in and outside Nigeria<sup>11-13</sup>, however, it differs from that of Joshi et al<sup>13</sup> in India series in which partial epilepsy with elementary symptomatology formed the largest seizure type. This finding may be partly attributed high frequency of traumatic head injury as the most common etiological factor at the time of the study.

Febrile illness, emotional stress, sleep deprivation, and tiredness were the most frequently reported precipitants. Among all precipitants, emotional stress was the most (46.7%) frequently cited. Incidence of stress may not be uniform among different populations, the finding in this study is higher than that quoted (13%) in rural Pakistan<sup>15</sup> and in an Austrian study (34%).<sup>16</sup> Variations in stressors or in stress management may account for these regional differences. Thus, stress management could be an important tool in these patients. Febrile illness, predominantly malaria fever is also commonly cited precipitating factor among our patients, therefore, prompt treatment of febrile illnesses in epileptic patients to forestall provocation of epileptic seizure attacks is key to successful management of epilepsy.

The highest proportion of patients with neurologic deficit was recorded in patients who had simple partial seizure and secondary generalized seizure as opposed to complex partial seizure and other seizure types this is in keeping with Curie et al report which showed a relatively low incidence of space occupying lesion in complex partial seizure<sup>17</sup>.

The higher proportion of neurologic deficit in partial seizure compared to primarily generalized could be due to higher incidence of structural lesion which incidentally constitute a discrete epileptic focus as well as being responsible for the neurologic deficit. This finding emphasizes the importance and relevance of the

presence of neurological deficit as a finding that should increase one's suspicion of an underlying structural lesion in the brain particularly when found in conjunction with partial epileptic seizure type in an adult. Nevertheless, the absence of neurological deficit no matter how subtle it is does not necessarily exclude, as seen in this study, structural brain lesion.

Among patients with indications for neuroimaging who had neuroimaging, the most common abnormality was cerebral infarct followed by tumour, these patients were above 25 years of age, hence, late onset epilepsy. Many studies carried out amongst Caucasians and Americans agree with the findings of this study. Ottonello G.A et al in their study of late onset epilepsy showed preponderance of cerebrovascular accident, trauma and alcohol as the most common aetiology<sup>18</sup>. The incidence of brain tumors occurring in patients of all ages under treatment for epilepsy was reported to vary from 0.6% to 20%<sup>19,20</sup>.

In this study more patients with abnormal CT scan had abnormal findings on neurological examination, thus, the presence of neurological deficit in a patient should spur the physicians to further evaluate epileptic patients with neuroimaging.

The frequency of EEG abnormality (epileptiform activity) in these subjects is comparable with that of Falope<sup>21</sup> and Ogunniyi<sup>22</sup> in Ibadan.

In this study, a large number of patients has had spiritual or traditional treatment before consulting orthodox medical practitioner, Treatments used in such cases which often reflect the beliefs about the illness that may or may not in different cases tally with the beliefs of patients, often defined epilepsy as a foreign body that had to be expelled from the body. Danesi et al<sup>23</sup> showed that 32.5% of patients questioned, though recognizing the effectiveness of medical treatment, nevertheless, would like to combine this with "native" or religious healing, suggesting that informal medicine still has some part to play in these communities in alleviating the nonmedical aspects of the disease. In general, however, it is clear that the availability of formal medicine is the only hope<sup>24</sup>.



Most of the patients in our series were treated with carbamazepine and or valproate, phenytoin or phenobarbitone. Apparently, these are the AEDs available in our setting; the new generations AEDs are scarce and expensive. Generally the cost is a major determinant of drug choice in epilepsy in the developing world, In our setting, phenobarbitone is the cheapest followed by phenytoin, carbamazepine and valproate. However, with these relatively old AED over 50% of our patient had good control of seizures.

## CONCLUSION

Conclusion: In our study, Complex partial and generalized tonic-clonic seizures appeared to be the most common epileptic seizure type seen in Kano. Cerebral infarct and tumour appeared to be the most common etiologic factors among subset of patients with symptomatic seizure. Majority of the patients would have sought spiritual or traditional treatment before coming to the hospital stressing the need for education.

Table 1. Distribution of sex along age group

Age group	Sex		Total
	Male	Female	
10-19	15	10	25
20-29	39	18	57
30-39	14	19	33
40-49	12	9	21
50-59	18	12	30
60-69	17	11	28
70-79	9	4	13
80-89	0	3	3
Total	124	86	210

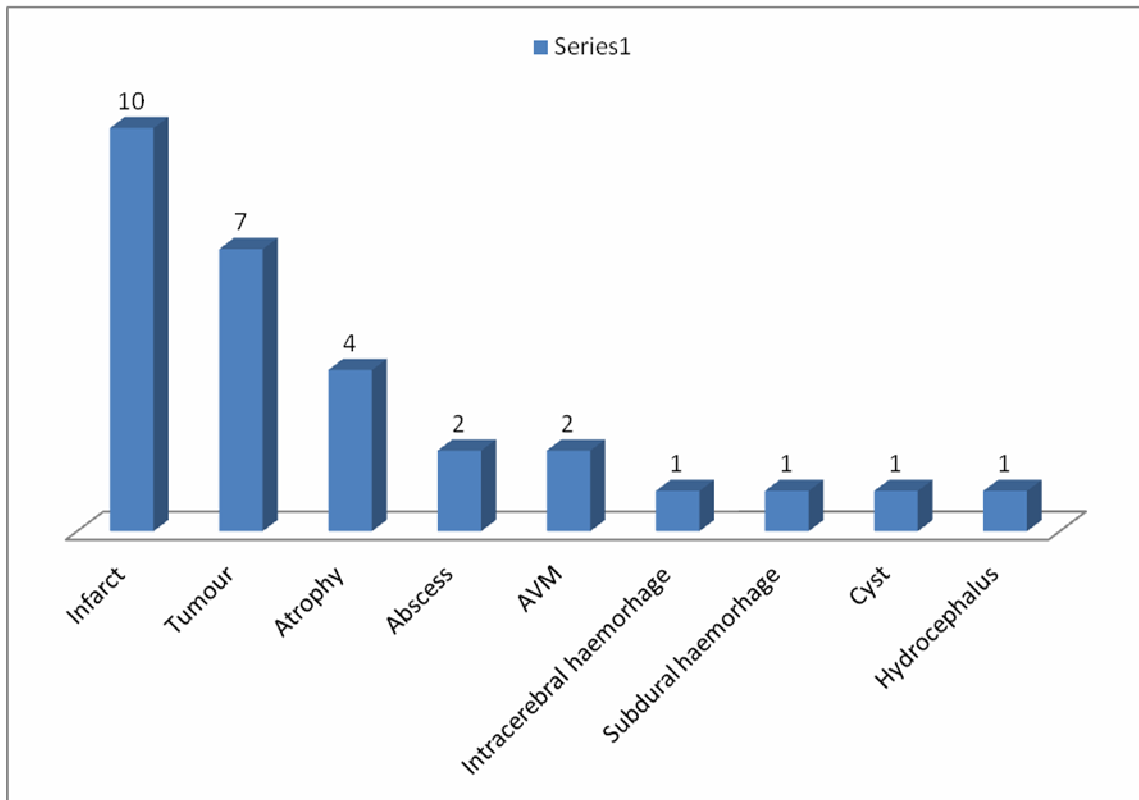
Table 2. Distribution of types of seizure by age group

Age grp	Seizure type						Total
	Generalized tonic-clonic	Myoclonic	Simple partial	Complex partial	Secondarily generalized	Absence seizure	
10-19	11	0	0	14	0	1	26
20-29	25	0	0	30	2	0	57
30-39	14	1	2	14	2	0	33
40-49	7	0	5	5	4	0	21
50-59	12	0	3	12	3	0	30
60-69	10	0	5	10	3	0	28
70-79	3	0	3	2	3	1	12
80-89	1	0	1	1	0	0	3
Total	83	1	19	88	17	2	210

Table 3. Complex partial seizure characteristics

Seizure Characteristics		Frequency	Percent (%)
Aura	Present	36	40.9
	Absent	52	59.1
Types of Aura	Sensory	20	*55.6
	Motor	12	*33.4
	Psychic	3	*8.3
	Autonomic	1	*2.7
Automatism	Present	36	62
	Absent	22	38
Types of Automatism	Oroalimentary	29	**78.4
	Ambulatory	3	**8.1
	Mimicry	5	**13.5

Figure 1. Distribution of identified etiological factors among those (29 patients) with suspected symptomatic epilepsy that had neuroimaging.



\*AVM (Arteriovenous malformation)

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