Original Article

The Distribution and Pattern of Neurological Disease in a Neurology Clinic in Ile-Ife, Nigeria

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ABSTRACT

Background: Neurological disorders are common and contribute significantly to disease burden, disability-adjusted life years and death. **Objective:** To assess the distribution of neurological disease in patients presenting to our hospital. **Methods:** The records of the Adult Neurology Clinic in Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun state, Nigeria were reviewed retrospectively for the years 2003-2005 and 2010-2014, and diagnoses as made by the Consultant were obtained and analyzed. **Results:** The total number of complaints was 1,524 and 86.4% of these were neurological in nature. Episodic and paroxysmal disorders (ICD-10) accounted for 54.1% of the diagnoses, and epilepsy and stroke were the most common of these. Of the 1,226 patients seen during the period, 91.4% had neurological disorders. The peak occurrence of these disorders was within the first three decades of life. **Conclusion:** Epilepsy and stroke are the commonest neurological disorders in the outpatient setting and there should be more studies in the community on their prevalence and impact.

KEYWORDS: *Disease, Ile-Ife, neurological, Nigeria, pattern*

INTRODUCTION

Neurological disorders are common.[1] Accounting for 6.3% of the global burden of disease, they contributed significantly to disease burden in 2005. Neurological disorders also caused a greater proportion of disabilities, accounting for 92 million disability-adjusted life years (DALYs). This is projected to increase to 103 million DALYs by 2030. Deaths from neurological disorders were found to be 12% of total deaths globally, making these disorders an important cause of mortality.[2]

Neuroepidemiological studies are important to ensure that people who have neurological disorders get access to care. These studies, when focused on the community, can unravel the actual extent of these diseases and direct health systems towards efficient and effective interventions.[3] Though healthcare professionals only see a small number of the patients with neurological disorders in the community,[4] neurology clinics can serve as a window to determining the distribution of these diseases.

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METHODS

The Adult Neurology Clinic of Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun state, Nigeria is run every Friday at the Medical Outpatient Department of the hospital. The clinic receives referrals from other hospital departments such as the General Out-Patient Department (GOPD), and from private and state hospitals as well. In our clinic, 10-15 patients are seen on each clinic day, and an average of 500 patients are seen in the GOPD weekly.

These patients come from Osun state which has a population of over 3 million people,[5] and surrounding states, namely, Ondo, Ekiti, Oyo and Lagos. They are usually non-emergent cases, but may be admitted when indicated, for example, epilepsy patients with poor control, stroke patients with complications, etc. We treat emergencies at the Accident and Emergency Department

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of the hospital, through which they are admitted to the ward. Patients who have received in-patient care from our unit also have their out-patient follow up in our clinic. The details of patients seen in our clinic are entered into the unit records after the case notes have been completed.

These unit records were reviewed retrospectively for the years 2003-2005 and 2010-2014, a total of eight years, in this study. Documentation was incomplete for the years 2006-2009, hence their exclusion from the study. The diagnoses as made by the Consultant were entered into a proforma, and classified based on the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) which placed "Diseases of the nervous system" in Chapter VI.[6] The diagnoses were made from a combination of clinical findings and investigations. All patients in the clinic had blood tests, including full blood count, electrolytes, urea and creatinine, and liver function test. Other investigations were requested as indicated. These include cerebrospinal fluid laboratory studies, neurophysiologic studies, radiographs, and neuro-imaging using Computed Tomography and Magnetic Resonance Imaging scans. All epilepsy patients had electroencephalography (*Profusion, Compumedics* 32-Channel EEG System). The Computed Tomography and Magnetic Resonance Imaging scanning machines were *General Electric* 4-slice and *General Electric* 0.2 Tesla machines respectively, but these were not widely available in the earlier years of the study and so diagnosis of conditions such as stroke at that time was mostly clinical.

Definition of some of the terms we have used in presenting the complaints received in the clinic are as follows:

- Seizures: a transient occurrence of signs and/or symptoms due to abnormal excessive or synchronous neuronal activity in the brain. At least two separate unprovoked seizures were used as definition of epilepsy in our study[7,8]
- Movement abnormalities: connotes movement disorder, a clinical phenomenon characterized by abnormal movement which could be hypokinetic (akinesia, rigidity) or hyperkinetic (tremor, chorea, dystonia, myoclonus)[9]
- Facial deviation: connotes peripheral facial palsy which is damage to the facial nerve, with or without its motor nucleus, resulting in paralysis of the muscles of facial expression.[10]

Results

A total of 1,318 neurological complaints were recorded from patients during the periods under review. The total number of complaints was however 1,524 bringing the neurological complaints to 86.4% of complaints obtained in the clinic during the period. The spectrum of complaints is as seen in Table 1.

Episodic and paroxysmal disorders (ICD-10) were the most common diagnoses accounting for over half (54.1%) of the diagnoses. Table 2 shows

Table 1: Leading complaints in the Adult Neurology Clinic of Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun state, Nigeria for the eight years of 2003-2005 and 2010-2014

Complaint	Frequency (%)*
Seizures	259 (17.0)
History of loss of consciousness	240 (15.7)
Weakness of limbs	197 (12.9)
Tremors and other movement abnormalities	182 (11.9)
Headaches	139 (9.1)
Cognitive difficulties	68 (4.5)
Facial deviation	58 (3.8)
Pain in limbs	52 (3.4)
Lumbar pain	36 (2.4)
Cervical pain	33 (2.2)
Sleep problems	29 (1.9)
Behavioral changes	25 (1.6)
Total	1318 (86.4)

*Percentages of the total number of complaints (1524)

Table 2: Neurological diseases diagnosed in the Adult Neurology Clinic of Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun state, Nigeria for the eight years of 2003-2005 and 2010-2014, classified according to ICD-10

ICD-10 classification	Frequency (%)
Episodic and paroxysmal disorders	
Epilepsy	373 (32.92)
Cerebrovascular diseases	145 (12.80)
Headaches	76 (6.71)
Sleep disorders	19 (1.68)
Other disorders of the nervous system	171 (15.09)
Extrapyramidal and movement disorders	129 (11.39)
Nerve, nerve root and plexus disorders	50 (4.41)
Other degenerative diseases of the nervous system	37 (3.27)
Polyneuropathies and other diseases of the peripheral nervous system	32 (2.82)
Diseases of myoneuronal junctions and muscle	16 (1.41)
Cerebral palsy and other paralytic syndromes	10 (0.88)
Inflammatory diseases of the nervous system	7 (0.62)
Systemic atrophies primarily affecting the nervous system	4 (0.35)
Demyelinating diseases of the central nervous system	1 (0.09)
Non-neurological disorders	63 (5.56)
Totals	1133 (100.00)

ICD=International Statistical Classification of Diseases and Related Health Problems

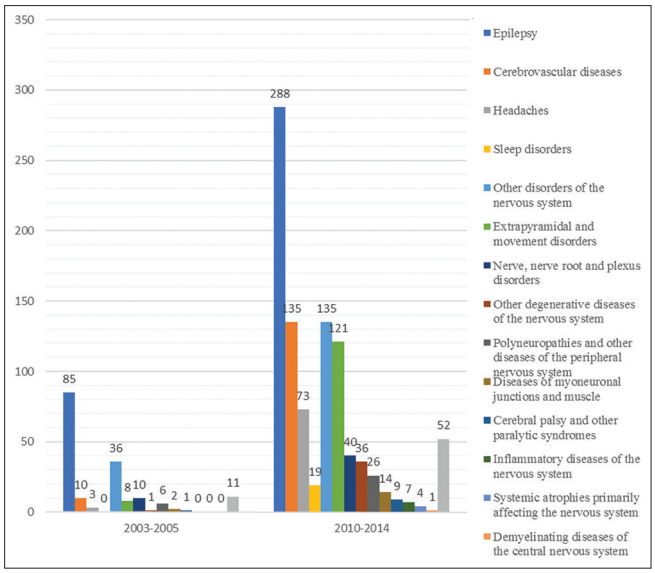

Figure 1: Comparison of the numbers of neurological diseases diagnosed in the Adult Neurology Clinic of Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun state, Nigeria in 2003–2005 and 2010–2014, classified according International Classification of Diseases, 10th Edition

Table 3: The 10 leading diseases in the Adult Neurology Clinic of Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun state, Nigeria for the eight years of 2003-2005 and 2010-2014

Disease	Frequency (%)*
Epilepsy	373 (32.9)
Stroke	134 (11.8)
Headaches	76 (6.7)
Parkinson disease	70 (6.2)
Cervical arthritis	45 (4.0)
Intervertebral disc disorders	41 (3.6)
Bell's palsy	38 (3.4)
Lumbar arthritis	38 (3.4)
Dementias	30 (2.6)
Peripheral neuropathy	26 (2.3)
Totals	871 (76.9)

*Percentages of the number neurological diagnoses made (1133)

Table 4: Age distribution of patients in the Adult Neurology Clinic of Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun state, Nigeria for the eight years of 2003-2005 and 2010-2014

Age (years)	Frequency (%)
1-10	20 (1.6)
11-20	185 (15.1)
21-30	246 (20.1)
31-40	143 (11.7)
41-50	123 (10.1)
51-60	183 (14.9)
61-70	156 (12.7)
71-80	155 (12.6)
>80	15 (1.2)
Totals	1226 (100.0)

the spectrum, using the ICD-10 Classification, of neurological diagnoses made in the patients seen during the study periods. A small percentage (5.56%) of the patients had non-neurological diagnoses. Amongst the episodic and paroxysmal disorders, and overall, epilepsy was the most common diagnosis [Table 3]. We made a similar observation when we compared the 2 periods. Episodic and paroxysmal disorders were the leading diagnoses in both periods, and epilepsy was most common overall. Most of the patients (84.73%) were seen within the second period, and this trend was maintained in all the diagnoses to varying degrees as shown in Figure 1. The fact that more patients were seen in the second period might suggest an increase in the frequency of episodic and paroxysmal disorders, particularly epilepsy. We did not assess aetiological factors in this study. The 10 leading diseases accounted for 76.9% of the 1,133 neurological diagnoses made.

During the review periods, 1,226 patients were seen and of these, 91.4% had neurological disorders, accounting for the 1,133 neurological diagnoses made (some patients had multiple diagnoses). No diagnosis was made in 1.9% of the patients seen and the rest had non-neurological diagnoses. The age distribution of the patients is displayed in Table 4.

Discussion

The pattern of neurological disease seen in our review has some similarities with previous studies done in other parts of Africa[11,12] and Nigeria.[13-21] While some of these studies reviewed out-patients and others in-patients, two reviewed both groups of patients.

Our finding that episodic and paroxysmal disorders (ICD-10) were most common was the same as in data from studies done in Yaoundé, Cameroon.[11,12] Amongst this group of neurological disorders, epilepsy had the highest percentage in our review and also in those from out-patients in Enugu, Nigeria (adult and paediatric) and Madagascar.[14,19,22] Our findings are similar to those from other authors who reviewed neurological admissions and documented that epilepsy occurred most frequently.[22] However, some authors found stroke to be the most common neurological disorder, accounting for majority of neurological admissions.[15-18,20,21] Epilepsy though most common in the out-patient setting, was not as commonly seen in in-patients most likely due to its chronic nature. It is also likely that the proportion of people with epilepsy will be higher in community-based studies.

Epilepsy has been described as the commonest non-infectious disease of the nervous system that brings patients to hospital in Africa.[23] In Nigerians below

40 years of age, idiopathic epilepsy has been described as the commonest type, while infections of the central nervous system such as meningitis, encephalitis, brain abscess and brain tuberculoma are some of the commonest causes of the disease.[3] Febrile convulsions have been found to be a significant risk factor for development of epilepsy in Nigerians.[8] Trauma is one of the common non-infectious causes of epilepsy in this part of the world,[3] and head injuries have been shown to pose significant risk for development of the disease in Nigerians. Childhood immunization against the common diseases was however found to be related to a reduced risk of the disease.[8,24]

In our review, stroke and headaches were the second and third leading diagnoses respectively, and similarly, Onwuekwe and Ezeala-Adikaibe[19] found stroke to be second in Enugu however, degenerative spinal cord diseases were the third common diagnosis, with headaches coming ninth. Andriantseheno and Andrianasy[22] found chronic headaches to be second, peripheral neuropathies third and cerebrovascular diseases fourth in their Neuropsychiatry department out-patients in Madagascar. The leading diagnoses as documented by Tegueu *et al*.[11] in Yaoundé were headaches, epilepsy and intervertebral disc disorder, with stroke being the eight most common diagnosis. Another similar Yaoundé study done in elderly people showed a different pattern of leading diagnoses with lumbar arthrosis, dementia and Parkinson's disease being the first three.[12] This is likely to be connected the advanced age of the study population (mean age was 68.83 years).

Our two leading diagnoses, epilepsy and stroke were also amongst the most common in hospital[13] and community-based[25] studies carried out by Osuntokun in Ibadan and Igbo-Ora, Nigeria. MacDonald *et al*.[4] also observed that epilepsy and cerebrovascular diseases were the most common neurological diseases in the communities they studied in the United Kingdom. Hirtz *et al*.[26] in their review to estimate the incidence and prevalence of 12 neurologic disorders in the United States and other developed countries, found stroke and epilepsy to be commonly seen by neurologists.

The percentage of our patients who had neurological diagnoses (91.4%) was far more than was seen in Enugu (48.7%).[19] The age distribution of Nigerians, with most of the population being within the first to third decade of life,[5] may have contributed to our finding of neurological disorders occurring more in this age group. That may however not be the only basis for this distribution. Epilepsy, our most common diagnosis, has a bimodal age incidence being high in the first year of life and in the elderly.[27] In Nigeria however, life expectancy is 53 years for males and 56 years for females, and the probability of dying between 15 and 60 years (per 1,000 population) is 357 for males and 325 for females.[28] Many in the population therefore do not get to become elderly before they die. This may further explain the age distribution we found in our study.

Conclusion

Epilepsy and stroke are the commonest neurological disorders in the outpatient setting and there should be more studies in the community on their prevalence and impact.

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Conflicts of interest

There are no conflicts of interest.

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