

PREVALENCE AND PATTERN OF NEUROLOGICAL DISORDERS IN ADULT PATIENTS SEEN AT AN OUTPATIENT RURAL TERTIARY HOSPITAL SETTING

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Abstract

Introduction: Neurological Diseases (NDs) are common and most disabling leading to significant morbidity and mortality globally particularly in resource constrained settings. This study was aimed at determining the prevalence, distribution and pattern of NDs seen at the outpatient family medicine clinics of Irrua Specialist Teaching hospital (ISTH), Irrua, Edo State, Nigeria.

Methods: A descriptive, retrospective review of hospital record was conducted for 1086 adult patients presenting to the general outpatient clinics of ISTH from January to December 2021 using hospital records. The diagnosis as made based on clinical findings and laboratory and radiological investigations using the 10th revision of the International Statistical Classification of Diseases and related Health Problems (ICD 10). Results were analysed using epi info version 3.5.4. level of significance was set at 0.05.

Results: The prevalence of neurologic disorders was found to be 2.06%. The age of respondents ranged from 18 to 93 years with a mean age of 46±18 years. They were mostly females 678 (62.4%), married 678 (62.4%) with majority of them being traders 315 (29.0%). The most common disorder among respondents was neuropathy 372 (34.3%) followed by Headache 368 (33.9%), Seizure Disorder 144 (13.3%), Stroke 98 (9.0%) and Migraine 20 (1.8%). There was association between age ($p < 0.001$), marital status ($p < 0.001$) and occupation ($p < 0.001$) with the above neurological disorders.

Conclusion: Neurologic disorders were common among the respondents with neuropathy, headache, seizure disorders, stroke and migraine being the most common. The study also found an association between these conditions with age, marital status and occupation.

Keywords: Neurologic Disorders, Migraine, Neuropathy, Headache, Stroke, Rural, Nigeria.

INTRODUCTION

Neurological Diseases (NDs) are most disabling. They are common and costly to manage and account for 6.3% of the global burden of diseases.¹ NDs are common and contribute significantly to disease burden, DALYs, and death.² Their burden is higher in developing countries partly due to lack of specialists and healthcare facilities particularly in rural areas.³ The overall burden of NDs significantly increased among adults in low- and middle- income countries.^{4,5}

There is a large prevalence of NDs in rural and suburban regions.¹ This large prevalence coupled with an increasing emphasis on primary focused care implies that primary care providers are likely to be increasingly managing NDs. Limited data exist to suggest how often patients with NDs present to their primary care providers or what the most common NDs might be.⁶

It is therefore important to know the disease prevalence and pattern as the burden of NDs is rising due to demographic and epidemiological changes. In addition, little is known about the epidemiology and clinical pattern of NDs particularly in Sub Saharan Africa. In Nigeria, available data are often derived from hospital-based studies.¹

AIM: The aim of this study was to determine the prevalence, pattern and distribution of NDs seen at the outpatient family medicine clinics of Irrua Specialist Teaching hospital (ISTH), Irrua, Edo State, Nigeria, in order to generate knowledge and contribute to the Public Health field in this setting.

METHODOLOGY

Design: The study was a retrospective review of hospital records, carried out at the family medicine clinics of ISTH between January and December 2021.

Setting: The study was conducted in the Family Medicine Clinics of Irrua Specialist Teaching Hospital (ISTH), a tertiary hospital located in Irrua, the headquarters of Esan Central LGA of Edo State. It receives patients from the immediate environ as well as from neighbouring states of Delta, Ondo, Kogi etc.

The family medicine clinics comprise the general outpatient department (GOPD) and National Health Insurance Authority (NHIA)/Staff clinics. These clinics run daily from Mondays to Fridays with emergency services throughout the week. The clinic constitutes a gateway to the hospital and various other specialist clinics amongst which is the Neurology clinic as well the Accidents and Emergency (A/E) unit. Patients generally assess medical services through these clinics except in few cases of formal referrals where such patients are sent directly to referral specialists. The clinics are run by consultant family physicians assisted by senior registrars and registrars. Daily average attendees in the family medicine clinics both GOPD and Staff/NHIS clinics is about 200/day (4,400/month and 52,800/year).

Participants: Adults with neurological diseases presenting to the family medicine clinics of Irrua specialist teaching hospital, Irrua

between January and December 2021 were included in the study. Patients without a clear-cut neurological condition and those with incomplete information were excluded from the study.

Data Collection: Hospital records of the family medicine clinics was used to extract records of patients with neurological diseases. The records were reviewed retrospectively from January 2021 to December 2021. The diagnosis as made by the consultants 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. The diagnosis were made from a combination of clinical findings and investigations. All patients in the clinic had blood tests including FBC, electrolytes urea creatinine and LFT. Other investigations were requested as indicated. These included radiographs and neuroimaging. All epilepsy patients had an EEG done.

Patients with NDs diagnosed via standard diagnostic criteria were classified based on the WHO classification for NDs as follows: Nerve/Muscle, MS, PD, Strokes, Epilepsy, Headache/Facial pains, Neurological infections, Head injury and tumour, Spinal conditions, Congenital disorders, and Dementia.

Definition of some of the terms we have used in presenting the complaints received in the clinics as:

Headache (Tension-Type Headache): It is a bilateral, mild to moderate headache with a pressing or tightening quality that is not aggravated by routine physical activity.^{7,8}

Migraine: It usually presents as a unilateral (bilateral in some cases), pulsating headache of moderate to severe intensity.⁹

Seizure: A transient occurrence of signs and or symptoms due to abnormal excessive or synchronous neurological activity in the brain.¹⁰ At least 2 separate unprovoked seizures were used as a definition in our study.

Movement Abnormality: Connotes movement disorder, a clinical phenomenon characterized by abnormal movement which could be hypokinetic (akinesia, rigidity) or hyperkinesia (tremors, chorea, dystopia, myoclonus).¹¹

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.¹²

The information were collected and entered into a semi-structured questionnaire. The information included sociodemographic characteristics of the patients including age, sex, marital status, and occupation.

Data Analysis: Information obtained from patients' records was analysed using epi info version 3.5.4. Categorical variables were summarized using frequency distribution tables. Prevalence was expressed in percentages. Chi square was used to test for association between the identified neurologic disorders and the sociodemographic characteristics of the respondents. P value of < 0.05 was considered significant.

RESULTS

A total of 1086 patients with neurologic conditions were seen in the General Outpatient Clinic of Irrua Specialist Teaching Hospital, Irrua, Nigeria from January to December 2021 given a prevalence of 2.06%. Their data were extracted from the hospital records and analysed and the results are as presented below.

The age of respondents ranged from 18 to 93 years with a mean age of 46 ± 18 years. Majority of respondents were between the ages 30 and 44 years 288 (26.5%). They were mostly females 678 (62.4%), married 678 (62.4%) with majority of them being traders 315 (29.0%). The sociodemographic characteristics of the respondents are summarised in Table 1.

Table 1: Sociodemographic Characteristics (N=1086)

Variable	Frequency	Percentage
Age		
(Mean Age 46 ± 18 years)		
< 30	261	24.0
30 – 44	288	26.5
45 – 59	252	23.2
≥ 60	285	26.3
Sex		
Female	678	62.4
Male	408	37.6
Marital Status		
Single	198	18.3
Married	678	62.4
Divorced	48	4.4
Widowed	162	14.9
Occupation		
Student	186	17.1
Farmer	303	27.9
Trader	315	29.0
Artisan	150	13.8
Civil Servant	132	12.2

The patients presented with different neurologic disorders during the period under review. The most common disorder among respondents was neuropathy 372 (34.3%) followed by Headache 368 (33.9%), Seizure Disorder 144 (13.3%), Stroke 98 (9.0%) and Migraine 20 (1.8%). Table 2.

Table 2: Common Neurological Disorders Seen (N=1086)

Variable	Frequency	Percentage
Amnesia	3	0.3
Nerve Root Lesion	15	1.4
Cerebellar Ataxia	3	0.3
Headache	368	33.9
Stroke	98	9.0
Degenerative disease of the Spine	10	0.9
Dementia	15	1.4
Neuropathy	372	34.3
Encephalopathy	9	0.8
Intra Cranial Space Occupying	6	0.6

Lesion (ICSOL)		
Migraine	20	1.8
Parkinson's Disease	9	0.8
Seizure Disorder	144	13.3
Sensorineural Hearing Loss	9	0.8
Vertigo	5	0.4

Table 3 shows the association between the sociodemographic characteristics of the respondents and the commonest neurological disorders seen during the period of the study (Neuropathy, Headache, Seizure Disorder, Stroke and Migraine). There was association between age ($p < 0.001$), marital status ($p < 0.001$) and occupation ($p < 0.001$) with the neurological disorders.

Neuropathy and stroke increased with increasing age; while headache had an inverse relationship with age. Also, seizure disorder and migraine were more common among the young compared to older respondents.

Across the five most common neurological disorders identified by the study, females were mostly affected than males but the difference was not statistically significant ($p = 0.200$).

Apart from migraine, respondents who were married had a higher occurrence of the common neurologic conditions compared to those who were single and the difference was statistically significant ($p < 0.001$).

Traders and farmers reported more cases of neurological disorders compared to students, artisans and civil servants and the difference was statistically significant ($p < 0.001$).

Table 3: Sociodemographic Characteristics and the Commonest Neurological Disorders

Variable	Neuropathy (372)	Headache (368)	Seizure Disorder (144)	Stroke (98)	Migraine (20)	χ^2	P value
Age						350.088	<0.001*
< 30	6 (1.6)	147 (39.9)	84 (58.3)	6 (6.1)	12 (60.0)		
30 – 44	105 (28.2)	117 (31.5)	27 (18.8)	9 (9.2)	3 (15.0)		
45 – 59	123 (33.1)	70 (19.6)	12 (8.2)	32 (32.7)	3 (15.0)		
≥ 60	138 (37.1)	34 (9.2)	21 (14.6)	51 (52.0)	2 (10)		
Sex						5.990	0.200
Female	243 (65.3)	227 (61.7)	78 (54.2)	62 (63.3)	11 (55.0)		
Male	129 (34.7)	141 (38.3)	66 (45.8)	36	9 (45.0)		
Marital Status						261.104	<0.001*
Single	6 (6.1)	99 (26.5)	69 (47.9)	3 (3.1)	12 (60.0)		
Married	264 (71.0)	244 (66.1)	57 (39.6)	57 (58.3)	2 (10.0)		
Divorced	18 (4.8)	5 (1.4)	9 (6.3)	7 (7.1)	6 (30.0)		
Widowed	84 (22.6)	20 (5.4)	9 (6.3)	31 (31.6)	0 (0.0)		
Occupation						263.124	<0.001*
Student	0 (0.0)	87 (23.6)	72 (50.0)	6 (6.1)	12 (60.0)		
Farmer	138 (37.1)	66 (18.0)	21 (14.6)	42 (42.9)	0 (0.0)		
Trader	135 (36.3)	101 (27.4)	24 (16.7)	20 (20.4)	5 (25.0)		
Artisan	66 (17.7)	57 (15.5)	12 (8.3)	12 (12.2)	0 (0.0)		
Civil Servant	33 (8.9)	57 (15.5)	15 (10.4)	18 (18.5)	3 (15.0)		

DISCUSSIONS

There is a wide spectrum of NDs in typical rural to suburban communities populated by mostly the poor and low-income earners.¹³ Findings in this study carried out in the Family Medicine Clinics, comprising primary care clinics in a tertiary hospital in Irrua, a rural community in Edo State, Nigeria are suggestive of the above assertion. NDs are chronic with only few being curable. They cause symptoms and disability which can be serious challenges for individuals. Their burden can have particularly devastating effects on the poor in rural areas and can include loss of gainful employment, with attendant loss of family income, the requirement for caregiving with further potential loss of wages, the cost of medications and the need for other medical services. Urban hospital-based studies give some perspective on the burden of NDs but there are no or few rural community-based studies especially from south eastern and south south Nigeria.¹³

The mean age of our patients was 46 years while the age range was 18 to 93 years. The largest age groups were two peaks which slightly approximated; 30 - 40 (26.5%) and the elderly above 60 yrs (26.3%). The mean age of our patients was approximately a decade higher than the mean ages of other studies carried out in rural to suburban communities specifically in southeast and southwest Nigeria.^{1,14} Despite this, the peak occurrence of ND in this study was within the first three decades similar to these other studies. It was however, similar to the mean age of a similar study in Sudan.¹⁵ Our study also showed a second peak among the elderly patients above 60 which corroborated the findings of a study carried out in 2 semi urban communities in SE Nigeria.¹⁴ This could be attributed to the increase prevalence of neurodegenerative conditions with age. Again, pain syndromes associated with neurodegeneration are characteristically common among the older age.¹⁴ Particularly so is the fact that in this study, stroke and peripheral neuropathy were significantly associated with age $P < 0.001$.

The female sex predominance in this study may reflect the female preponderance of NDs corroborating other findings.^{1,13}

Pain syndromes are characteristic among females who usually may present early unlike male counterparts who may delay based on cultural beliefs regarding them as stronger sexes.¹⁴

As shown in table 2, the burden and pattern of NDs is high in rural communities reported also in other findings,^{13,14} where a large proportion of the population have no direct access to neurological care as most of the few Neurologists in Nigeria are clustered in urban centres, Irrua inclusive.¹⁴

The burden of NDs is increasing and thus primary care physicians maybe responsible for caring for a significant proportion of patients with NDs. Many NDs can be managed by primary care physicians who also should have a low threshold to refer to a neurologist especially when symptoms worsen or a satisfactory diagnosis remains elusive.⁶ The

pattern depicted on table 2 may help in tailoring primary care training towards the common NDs in general practice for better management.

The most common NDs were peripheral neuropathy(34.3%), Primary headache syndrome (33.9%), seizures (13.3%), stroke(9.0%) and migraine(1.8%). This pattern was similar to findings of similar studies by Longe and Osuntokun in a rural setting in southern Nigeria and Otubogun et.al in southwestern Nigeria in which headaches, epilepsy, stroke and peripheral neuropathy were common findings.^{1,16} These findings however were at variance to the pattern of NDs at urban specialist neurology department where the commonest ND was stroke with seizures and movement disorders in varying proportions. The findings also compare with those of a study in Sudan where stroke, epilepsy and headache where the commonest neurologic disorders seen in a dedicated neurologic clinic.¹⁵

Peripheral neuropathy was the commonest ND in this study (34.3%) followed by headaches(33.9%). The high frequency of pain syndromes also reported in a similar study comprising headaches and neuropathy have multiple aetiologies contributed to by personal factors and environmental stress.¹³ Overall, females were commonly more affected than males similar to other findings.^{1,13,14} This could be due to the slight female predominance in this study. Findings also suggest that pain syndromes commonly assoc with neurodegeneration are commoner among females.

Among the common NDs in this study, peripheral neuropathy and stroke were significantly assoc with increasing age($P<0.001$) while headache syndromes were inversely associated with age. The association of peripheral neuropathy and especially stroke with its cardiovascular risks maybe related to the increase cardiovascular risk factors for stroke with age and probable increase life expectancy as well as reports of a high prevalence of stroke survivors in south south Nigeria.¹ Surveys in Nigeria report the mean age of stroke to be 62 years.

Primary headache was a common ND in our finding which was inversely related to age. Reports suggest headaches are among the top three most common neurological conditions for most age groups, starting from age 5 and remaining in the top three until the age of 80. Despite regional variations, headache disorders are worldwide problems affecting people of all races, income levels and geographical areas.¹⁷

Among the five most common NDs, the burden was more among females. The burden was also significantly associated with traders and farmers ($P<0.001$) compared to students and civil servants.

CONCLUSION

NDs are a common occurrence in rural and suburban communities. These communities lack specialist neurologist and neurosurgeons. The burden of care falls on primary care

physicians to manage many of these conditions. The most common NDs in such communities were peripheral neuropathy, headaches, seizure disorders and stroke which differ from those seen in urban specialist neurology settings where stroke, seizures and movement disorders were commoner. The burden of NDs was more among females, farmers and traders. There is therefore the need to tailor primary physicians training in this regard.

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