Original Article

PATTERN OF NEUROLOGICAL DISORDERS MANAGED IN NEUROLOGY CLINICS IN KANO, NIGERIA

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Abstract

Background: Neurological disorders result in a number of disabilities with consequent increase in financial and caregiver burdens.

Objective: To determine the pattern of neurological disorders managed in some neurology clinics in Kano, Nigeria.

Materials and Methods: A five-year retrospective descriptive survey (2016-2020) of patients with neurological disorders attending neurology out-patient clinics at three selected hospitals in Kano metropolis. A research proforma was used to collect information on socio-demographic and health characteristics of the participants. Case folders and outpatient registers were used as a source of information about the patients. Data obtained was analyzed using IBM Statistical package for social science (SPSS) version 20 and results presented using descriptive statistics of frequency and percentage.

Results: Out of the 433 cases with neurological disorders surveyed, 58% were adult and 42% were paediatric. Males (54.3%) were found to be more affected. Majority (83.4%) of the participants were from an urban area, with married (79.7%) individuals mostly affected. Stroke was the most prevalent (33.7%) neurological disorder. Hypokinesia (5.1%) and hyperkinesia (3%) as a primary and secondary movement disorder respectively were the most prevalent forms of movement disorder. Psychotic symptoms, weakness, paresthesia, fever, vomiting and convulsion were the most common manifestations that comes with the neurological disorders. Of the common neurological disorders, stroke was most associated with motor (56.2%), sensory (36.4%) and psychiatric (43.5%) manifestations.

Conclusion: Paediatric age group contributed close to half of neurological disorders. Stroke was the most prevalent form of neurological disorder and most associated with motor, sensory and psychiatric manifestations. Hypokinesia and hyperkinesia had close prevalence and were the most common primary and secondary movement disorders respectively.

Key word: Neurological disorders, Stroke, CVA, Prevalence, Pattern, Manifestations.

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INTRODUCTION

Neurological disorders are diseases of the central and peripheral nervous system, which affect many people worldwide regardless of their income, age, sex or education.[1] They are chronic life-threatening disorders which negatively impact on the overall human life.[2] Worldwide, neurological disorders are a major cause of death and disability-adjusted life- years (DALYS), and with their huge burden, they challenge the sustainability of the health system.[3] The rise in neurodegenerative diseases because of extended life expectancy highlights the disabling impact of the neurological disorders.[4] It has been reported that when compared with other human disorders, the degree of mortality and disability due to neurological and neuropsychiatric disorders is significantly more.[2]

In Sub-Saharan Africa, these disorders are becoming progressively prevalent, with factors such as demographic transitions, malnutrition, increased vehicular traffic,

adverse perinatal conditions, persistent regional conflicts and certain disease conditions including human immunodeficiency virus and acquired immune deficiency syndrome responsible for their increased burden.[5] The burden and magnitude of neurological, mental and behavioural disorders is enormous which manifest with the cost of medications; requirement for care given, with possible loss of wages; loss of gainful employment, with associated loss of family income; in addition to discrimination, stigmatization and human rights violations of the victims.[6]

According to the United Nations 2007 report, globally, up to 1 billion people are affected by neurological disorders (nearly 1 in every 6 people) and 6.8 million people die yearly from the disorders.[1] A Nigerian hospital-based retrospective study has shown prevalence of neurological disorders to be 48.7% in Enugu.[7] In addition, a semi-urban community prevalence study in Edo State Nigeria revealed prevalence of neurological disorders to be 45.4%.[4] Another community based study in southwest Nigeria has shown neurological disorders to have crude prevalence of 352 per 1000 population.[8] The burden of neurological disorders is more in developing countries owing to factors such as non-availability of health care facilities and specialists to tackle the disorders.[4] In addition, though the burden of chronic neurological conditions is expected to be devastating in poor populations, unfortunately such burden appear to be largely unrecognized in developing countries.[6]

Patients with neurological disorders have been reported to have significant increase in relative prevalence of movement disorders.[9] The movement disorders which are not associated with spasticity or muscular weakness change the function of the central nervous system (CNS) and most of them are characterized by slow progression.[10] Movement disorders are common conditions with variable, complex and sometime bizarre clinical presentation, thus making their correct established diagnosis difficult.[11] They are a specific group of neurological disorders which are essentially difficult to be properly diagnosed.[10]

Movement disorders are classified as a group of neurological diseases, signs, or symptoms which present as either movement paucity or slowness, or by excessive involuntary movement which is not normal.[12] They are one of the main etiologies of chronic neurologic disabilities in older population.[13] It has been reported that due to the nature and pathologic mechanism of occurrence of movement disorders, as well as an older population and exposure to industrial toxins, the prevalence of the disorders is expected to be more in developed countries than in developing countries.[9]

Despite the substantial impact of neurological disorders, knowledge of their epidemiology such as differences in disease frequency across time and places, as well as understanding related risk factors especially in low and middle income countries is still limited.[14] When compared with developed countries, the neurological disorders may be responsible for a disproportionate burden in sub-Saharan Africa; where a rise in prevalence of the disorders and epidemiological transitions pose a key danger to economic improvement and livelihood.[15] Moreover, during the course of neurological disorders, the disorders and the degree of severity could increase, decrease, or may not change over time. Furthermore, despite some functional recovery in patients with neurological disorders, challenges with the components of normal movement will impact on normal functioning and the patients' general wellbeing including their quality of life. Hence it is important to continuously study the pattern of neurological disorders. The objective of this study is to determine the pattern of neurologic disorders managed in some neurology clinics in Kano, Nigeria.

MATERIALS AND METHODS

Study design: This was a multicentre, five-year retrospective descriptive survey conducted between January 2016 and December 2020 in three selected referral hospitals in Kano, Nigeria.

Study Setting: The study was conducted in Murtala Muhammad Specialist Hospital (MMSH), Muhammad Abdullahi Wase Teaching Hospital (MAWTH), and Hasiya Bayero Paediatric Hospital (HBPH), all in Kano metropolis. The hospitals were selected on the basis of being specialist/referral hospitals and for convenience. There are three other specialist/referral hospitals in Kano metropolis.

Study Population: Patients with neurological disorders attending neurology out-patient clinics at the three selected hospitals in Kano metropolis.

Data Collection: The out-patient case folders of patients with neurologic disorders were retrieved using purposive sampling technique. Data was collected by going through each patient's case folder to obtain information on socio-demographic characteristics, health characteristics such as comprehensive clinical history, clinical manifestations, symptoms, signs and diagnosis of neurological disorder as reported in the patient's case folder. All the information were recorded in research proformas. Out-patient registers were also used where necessary to assess certain information in the data collection process.

Data Analysis: Data obtained was analyzed using IBM Statistical package for social science (SPSS) version 20 and results presented using descriptive statistics of frequency and percentage.

RESULTS

A total of 433 cases with neurological disorders were surveyed. Of these, adults accounted for 58% of the cases and 42% were paediatric. Paediatric neurological disorders were more common between the age of 1-15 years, while adults with neurological disorders were mostly in the age range 46-60 years. Males were the most affected constituting 54.3%. Majority of the participants (83.4%) were from urban areas. Most of the patients were of the Hausa ethnic group (97.0%) and Muslims (99.1%). Table 1 details the socio-demographic characteristics of the participants.

The most common type of neurological disorder was stroke (33.7%), followed by cerebral palsy (23.1%). Down syndrome, myasthenia gravis, neurofibromatosis, spinal cord injury, multiple sclerosis and Alzheimer's disease were found to be least occurring with each accounting for 0.2% of the cases (Table 2).

Table 1: Socio-demographic characteristics of the participants

VARIABLE	FREQUENCY (n = 433)	PERCENTAGE (%)
Name of Hospital		
MMSH	230	53.1
MAWTH	59	13.6
HBPH	144	33.3
Age in Years		
1-15 Years	170	39.3
16-30 Years	37	8.5
31-45 Years	38	8.8
46-60 Years	86	19.9
61-75 Years	75	17.3
76-100 Years	27	6.2
Population		
Adults	251	58.0
Paediatrics	182	42.0
Gender		
Male	235	54.3
Female	198	45.7
Address		
Rural	72	16.6
Urban	361	83.4
Marital Status		
Single	30	12.0
Married	200	79.7
Widow	21	8.4

Ethnicity		
Hausa	420	97.0
Fulani	11	2.5
Yoruba	2	0.5
Occupational Status		
Student	40	9.2
Employed Civil Servant	41	9.5
Business	33	7.6
Full Housewife	30	6.9
Employed Non-Civil Servant	15	3.5
Farmer	4	0.9
None	270	62.4
Religion		
Islam	429	99.1
Christianity	4	0.9

Table 2: Types and distribution of diagnosed neurological disorders

VARIABLES	FREQUENCY (n = 433)	PERCENTAGE (%)
Stroke	146	33.7
Down Syndrome	1	0.2
Seizure Disorders	60	13.9
Migraine	16	3.7
Encephalopathy	3	0.7
Motor Neuron Disease	4	0.9
Epilepsy	13	3.0
Thalamic Pain Syndrome	2	0.5
Peripheral Nerve Injury	18	4.2
Bell's Palsy	3	0.7
Myasthenia Gravis	1	0.2
Meningoencephalitis	6	1.4
Cerebral Atrophy	3	0.7
Cerebral Malaria	2	0.5
Brain Tumour	4	0.9
Dementia	4	0.9
Meningitis	11	2.5
Neurofibromatosis	1	0.2
Cerebral Palsy	100	23.1
Demyelination	2	0.5
Spinal Cord Injury	1	0.2
Hydrocephalus	2	0.5
Multiple Sclerosis	1	0.2
Alzheimer's Disease	1	0.2
Movement disorder	28	6.5
Total	**433**	**100**

In table 3 below, primary and secondary movement disorders were present in 13.9% of the cases. For primary movement disorders which constituted 6.47% of all the neurological disorders, hypokinesia was the most prevalent (5.1%). For secondary movement disorders which constituted 7.39% of the neurologic conditions, hyperkinesia was the most common affecting 3.0% of the cases.

Of the common neurological disorders, stroke was most associated with motor (56.2%), sensory (36.4%) and psychiatric (43.5%) manifestations (Table 4). Cerebral dysfunction manifestations were found more in cerebral palsy cases (25.5%), closely followed by those found in seizure disorder; 22.3% and stroke; 22.3% cases (Table 4).

Table 3: Distribution and pattern of primary and secondary movement disorders

VARIABLES	FREQUENCY (n = 433)	PERCENTAGE (%)
Presence of Movement Disorders (both primary and secondary)		
Yes	60	13.9
No	373	86.1
Total	**433**	**100**
Primary Movement Disorders (n=28)		
Hyperkinesia	5	1.2
Hypokinesia	22	5.1
Dyskinesia	1	0.2
Not Present	405	93.5
Total	**433**	**100**
Secondary Movement Disorders (n=32)		
Hyperkinesia	13	3.0
Hypokinesia	8	1.8
Dyskinesia	11	2.5
Not Present	401	92.6
Total	**433**	**100**

Table 4: Manifestations frequently associated with common neurological disorders

	Manifestations			
Neurologic Disorder	**Psychiatric manifestations n (%)**	**Motor manifestations n (%)**	**Sensory manifestations n (%)**	**Cerebral dysfunction manifestations n (%)**
Stroke	10(43.5)	131(56.2)	12(36.4)	41(22.3)
Cerebral palsy	2(8.7)	36(15.5)	1(3.0)	47(25.5)
Seizure disorder	4(17.4)	14(6.0)	1(3.0)	41 (22.3)
Other neurologic disorders combined	7(30.4)	52(22.3)	19(57.6)	55 (29.9)
Total	**23(100)**	**233(100)**	**33(100)**	**184(100)**

Table 5 indicate that psychotic symptoms are the most common among psychiatric manifestations and was present in only 2.5% of patients with neurological disorders. The most common motor manifestation was weakness affecting 30.9% of patients with neurological disorders. Paresthesia was the most common sensory manifestation and it affected only 3.9% of patients with neurological disorders. Vomiting and convulsion were the most common of the gastrointestinal tract (GIT); urinary, and cerebral dysfunction manifestations, affecting 5.8% and 24.7% respectively. The most common other medical manifestation was fever affecting 29.1% of patients.

Table 5: Pattern and distribution of manifestations related with neurological disorders

VARIABLE	(n = 433)	(%)
Psychiatric manifestations		
Depression	5	1.2
Psychotic Problem	11	2.5
Confusion	7	1.6
Not Present	410	94.7
Motor manifestations		
Facial Deviation	12	2.8
Weakness	134	30.9
Aphasia	40	9.2
Dysphagia	13	3.0
Stiffness	19	4.4
Hypertonia	15	3.5
Not Present	200	46.2
Sensory manifestations		
Pain	11	2.5
Paraesthesia	17	3.9
Numbness	5	1.2
Not present	400	92.4
GIT and urinary manifestations		
Vomiting	25	5.8
Nausea	4	0.9
Incontinence	7	1.6
Epigastric Pain	6	1.4
Constipation	5	1.2
Not Present	386	89.1
Cerebral dysfunction manifestations		
Headache	35	8.1
Convulsion	107	24.7
Loss of consciousness	14	3.2
Headache and Convulsion	6	1.4
Dizziness	12	2.8
Headache and dizziness	10	2.3
Not Present	249	57.5
Other medical manifestations		
Swelling	13	3.0
Fever	126	29.1
Blurred Vision	15	3.5
Psoriasis	1	0.2
Not Present	278	64.2

DISCUSSION

The study describes the pattern of neurological disorders managed in three neurology clinics in Kano over a five-year period. The finding from this study that adult neurological disorders occurred mostly between age 46 – 60 years is in keeping with the finding of Balarabe and Kamfani,[16] where neurological disorders were found more between the age of 45 and 54 years. Paediatric neurological disorders were more common between the ages of 1-15 years. Moreover, from this study paediatric age group contributed close to half (42%) of neurological disorders, and it can therefore be inferred that the paediatric age group has a similar burden of neurological disorders as the adult population. This is not far from the result of the study by Badaru et al[17]also in Kano, that reported paediatric neurological disorders to be the most frequently managed cases in out-patient physiotherapy clinics. These findings are attributable to the fact that poor circumstances of birth, limited resources for neonatal care, and increased risk of childhood diseases and injuries in sub-Saharan Africa, expose paediatric patients to neurological diseases such as cerebral palsy, seizure and epilepsy among others.[5]

Males were more affected by neurological disorders than females. This finding is similar to that of Balarabe and Kamfani,[16] but differs from the report by Wenning et al[13] that the proportion in men and women were closely similar. This study found that participants from urban settings are more affected. This is in line with the report of Del Bruttto and Del Brutto,[9] that exposure to industrial toxins may bring about more prevalence of movement disorders in developed countries. Beyond more industrialization and the higher population of urban settings as an explanation for the urban to rural difference in this study, the fact that urban dwellers tend to have better access to hospital and health care than rural dwellers in Nigeria may increase awareness and reportage of neurologic disorders.

From this study, employed civil servant and students where the most affected by neurological disorders among the occupations recorded. The proportion of students affected is possibly a reflection of the contribution by the paediatric age group to cases of neurological disorders, while employed civil servants are likely to be more educated and/or better informed, and are more likely to seek hospital care. Most of the patients being Muslims from this study is because the indigenes of Kano State, and people from surrounding northern states in Nigeria are predominantly Muslims.

The most common neurological disorder was stroke, this is in tandem with the findings of Balarabe and Kamfani.[16] However, in a study by Onwuekwe and Eeala-Adikaibe[7] in Enugu, Nigeria, epilepsy was the commonest neurological disorder followed by stroke. Peripheral neuropathy was the commonest neurological disorder followed by chronic headache in a Ugandan study by Kaddumukasa et al.[15] Cerebral palsy was found to be the second commonest neurological disorder in this study, in tandem with the contribution of the paediatric age group to neurological disorders in this study. Also, this finding is in line with the finding of Badaru et al,[17] that cerebral palsy was the commonest paediatric neurologic disorder managed by physiotherapists in Kano, Nigeria. Myasthenia gravis, Multiple sclerosis, spinal cord injury, Down syndrome, neurofibromatosis, had the least percentage occurrence in this study. This finding may be a reflection of racial/geographical distribution of these disorders, except for spinal cord injury. There is a possibility of under reporting of spinal cord injuries as it is perceived as incurable and many victims may have resigned to faith. The pattern of neurological disorders as reported in this study and by other cited studies is in line with World Health Organisation (WHO) report of 2007[18] that up to one billion people are affected worldwide by neurological disorders ranging from epilepsy to Alzheimer's disease, and from stroke to headache among others.

This study reported the overall prevalence of movement disorders to be 13.9%. For the purpose of this study and clarity, movement disorders were categorized in to primary (movement disorder diagnosed alone and is not co-occurring with another neurologic disorder) and secondary (movement disorder found to be manifesting and co-occurring with another diagnosed neurologic disorder). The prevalence of primary compared to secondary movement disorders in this study is close. Previously, a Lagos based study by Okubadejo et al[19] reported the prevalence of movement disorders to be 28% and Wenning et al[13] conducted a study in Italy and also reported the prevalence of movement disorders to be 28%.

However, a study by Onwuekwe and Ezeala-Adikaibe in Enugu, Nigeria showed movement disorders to be 5.6%.[7] This variation in the reported prevalence of movement disorders may result from sample size variations. Moreover, underdiagnosis of secondary movement disorders can further reduce the reported prevalence of movement disorders, as management may have been instituted with the primary neurological disorder before a movement disorder is noticed. Hypokinesia was the most common form of primary movement disorder. This is possibly because parkinsonism is a component of many movement and related disorders. On the other hand, hyperkinesia was the most common form of secondary movement disorder.

Of the common neurological disorders, stroke was most associated with motor, sensory and psychiatric manifestations. This is likely because as stroke is a neurovascular disorder, the pathology may affect areas that control psychological, motor and sensory functions. Cerebral dysfunction manifestations were found mainly in cerebral palsy cases closely followed by stroke and seizure disorder. This study indicates psychotic symptoms to be the most common psychiatric manifestation followed by confusion and depression. This is in line with the assertion that psychiatric conditions frequently manifest in the situation of neurologic diseases, because brain dysfunctions due to conditions resulting in neurologic symptoms also affect brain areas which control cognition, mood, perception and emotion.[20] The most common motor manifestation was weakness, and this is in line with stroke as the most prevalent neurological disorder. This finding supports the statement by Saguily[21] who reported neurologic disorders to be among the frequent etiologies of muscle weakness in adult. Paresthesia was the commonest sensory symptom. Paresthesia can result from disorders affecting the CNS,[22] for example, stroke as recorded in this study. Fever was the most common medical manifestation. This may not be unconnected with the fact that the central mechanism for the control of body temperature is housed by the brain and almost all illness resulting to fever interact with CNS.[23] Vomiting was the commonest GIT manifestation. CNS disorders have been documented to cause nausea and vomiting.[24] Convulsion was found to be the commonest cerebral dysfunction manifestation, followed by headache, then combined headache and convulsion. In line with a link between convulsion, cerebral dysfunction manifestation and cerebral palsy seen in this study, it is documented that in the pediatric age group, one of the most common occurring neurologic problem is convulsive disorder.[25]

Because only data from three selected hospitals in Kano metropolis in Nigeria, was used for this study, the size of the data used was a limitation and studies that will include larger data are recommended.

CONCLUSION

Paediatric age group contributed close to half of neurological disorders, and it can therefore be inferred that the paediatric age group has a similar burden of neurological disorders as the adult population. Stroke was the most prevalent form of neurological disorder. Psychotic symptoms, weakness, paresthesia, fever, vomiting and convulsion were the most common manifestations associated with neurological disorders. Stroke was most associated with motor, sensory and psychiatric manifestations. Hypokinesia and hyperkinesia had close prevalence and were the most common primary and secondary movement disorders respectively.

AUTHOR CONTRIBUTIONS

Both authors contributed equally to the conceptualization and design of the study, the acquisition, analyses, interpretation of the data and writing of the manuscript.

CONFLICT OF INTERESTS

The authors have no conflict of interest.

ETHICAL APPROVAL

Ethical approval to conduct the research was sought for and obtained from the Health Research Ethics Committee of Kano State Ministry of Health.

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