

## ETUDE EPIDEMIOLOGIQUE

## THE PATTERN OF NEUROLOGICAL DISORDERS SEEN IN A PRIVATE HEALTHCARE INSTITUTION IN LAGOS, NIGERIA: A PRELIMINARY THREE (3) YEAR REVIEW.

## LES AFFECTIONS NEUROLOGIQUES OBSERVEES DANS UN ETABLISSEMENT DE SANTE PRIVE A LAGOS AU NIGERIA: UNE ETUDE PRELIMINAIRE SUR TROIS (3) ANS.

DANIEL A. Adefemi.<sup>1</sup>

1. Department of Neurosciences, Lagoon Hospitals Hygeia 17B, Bourdillon Road, Ikoyi, Lagos State, Nigeria

E-Mail Contact - Adefemi A. DANIEL : adefemi.daniel@lagoonhospitals.com

**Mots clés:** Lagos, Troubles neurologiques, Soins de santé privés**Key Words:** Lagos, Neurological Disorders, Private Healthcare

## ABSTRACT

## Introduction

Neurology is a rare specialty in Nigeria where the current specialist to patient ratio is approximately 1:3000000. The aim of this study was to describe the pattern of neurological disorders seen in the Adult Outpatient Neurology Clinics in a Private Healthcare Institution in Lagos-Nigeria.

## Method

The electronic records of all outpatients seen by the author in Lagoon Hospitals, Hygeia over a three year period (July 2014 and Dec 2017) were retrieved and reviewed. Neurological disorders were grouped into 18 broad diagnoses using the ICD 10 nomenclature.

## Results

Headache, spondylosis, stroke, epilepsy, peripheral neuropathies and movement disorders were the most frequent diagnoses constituting 28.47%; 18.32%; 14.58%; 9.60%; 8.65%; and 8.17% respectively. Among patients with headache, tension-type headache was the most frequent diagnosis (41.39%) while migraine headaches constituted 27.99%. Ischemic stroke constituted 84.11% of recorded stroke cases while intracerebral hemorrhage made up 4.67%. All were confirmed by neuroimaging studies.

## Conclusion

In the typical adult outpatient neurology practice headaches, stroke, epilepsy, movement disorders and degenerative diseases of the spine are five commonly seen disorders and therefore the most likely to offer the largest returns for investors in neurology and neuro-rehabilitative medicine.

## RESUME

## Introduction

La neurologie est une spécialité rare au Nigéria où le ratio spécialiste / patient actuel est d'environ 1: 3000000. Le but de cette étude était de décrire le schéma des troubles neurologiques observés dans les cliniques de neurologie pour adultes ambulatoires d'un établissement de santé privé à Lagos au Nigéria.

## Méthode

Les enregistrements électroniques de tous les patients ambulatoires consultés par l'auteur dans les hôpitaux

Lagoon, à Hygeia, sur une période de trois ans (juillet 2014 et décembre 2017) ont été récupérés et examinés. Les troubles neurologiques ont été regroupés en 18 diagnostics généraux selon la nomenclature de la CIM 10.

### Résultats

Maux de tête, spondylose, accidents vasculaires cérébraux, épilepsie, neuropathies périphériques et troubles du mouvement étaient les diagnostics les plus fréquents, soit 28,47%; 18,32%; 14,58%; 9,60%; 8,65%; et 8,17% respectivement. Parmi les patients souffrant de céphalées, le diagnostic de céphalée de type tension était le diagnostic le plus fréquent (41,39%), contre 27,99% pour les migraines. Les accidents vasculaires cérébraux ischémiques constituaient 84,11% des cas d'AVC enregistrés, tandis que les hémorragies intracérébrales représentaient 4,67%. Tous ont été confirmés par des études de neuroimagerie.

### Conclusion

En neurologie, les accidents vasculaires cérébraux, l'épilepsie, les troubles du mouvement et les maladies dégénératives de la colonne vertébrale sont les cinq troubles les plus fréquemment observés et sont donc les plus susceptibles d'offrir les rendements les plus importants pour les investisseurs en neurologie et en médecine neuro-éducative.

## INTRODUCTION

Neurology has remained a relatively rare specialty in Nigeria leaving several patients under/misdiagnosed and therefore mismanaged. With less than 60 neurologists practicing in different states of the country, the current specialist to patient ratio is approximately 1:3000000<sup>6</sup>.

The sub-optimal management of neurological disorders in Nigeria is also due to the prohibitive cost of investigations and medications in addition to the inadequacy of rehabilitative services in the country<sup>2</sup>. This is especially so when the cost of care is borne out of pocket.

Lagoon Hospitals Hygeia is the largest private hospital franchise in Nigeria with more than 30 years of quality healthcare service delivery in all specialties in medical practice. The hospital records the most successful implementation of insurance medicine and managed health care nationwide. It serves more than 40 Health Maintenance Organizations (HMOs); delivers standard health care to public civil servants under the coverage of the National Health Insurance Scheme; and has a robust base of patients who access services within its facilities privately.

The services available for the management of neurological disorders include the immediate access to brain imaging (CT/MRI); round the clock laboratory services; an efficient intensive care service for life threatening presentations; and a structured neuro-rehabilitation team comprising physical, nutritional; speech and occupational therapists with a common goal to reduce the morbidity and mortality from these disorders to a bearable minimum and improve the functional outcome of patients managed.

The aim of this study was to describe the pattern of neurological disorders seen in the hospitals' Adult Outpatient Neurology Clinics and add to the available data that guide the allocation of human and material resources towards the optimum management of neurological disorders and the advancement of neurological services offered by the hospital.

## METHOD

The electronic records of all outpatient cases seen by the author over a three year period (July 2014 and Dec 2017) were retrieved and reviewed. All general medical cases were immediately excluded. Neurological disorders were grouped into 18 broad diagnoses using the ICD 10 nomenclature: Cerebral Palsy, unspecified; Sequelae of other infectious and parasitic diseases (CNS Infections); Sequelae of Inflammatory Disease of the Central Nervous System (CNS Inflammation); Toxic Effect, Organophosphate and Carbamate Insecticides (CNS Poisoning); Dementia, unspecified; Dizziness and Giddiness; Epilepsy, unspecified; Headache; Malignant Neoplasm, brain unspecified (CNS Neoplasms); Extrapyrimalid and Movement Disorder, unspecified (Movement Disorders); Myasthenia gravis (Neuromuscular Diseases); Peripheral

<http://ajns.paans.org>

Neuropathy, unspecified; Somatoform disorder, unspecified (Psychiatry); Sleep Disorders, unspecified; Nerve Root and Plexus Compressions in Spondylosis; Stroke not specified as hemorrhage or infarction; Syncope; and Trauma<sup>19</sup>. Data was inputted on the Microsoft Excel 2010 spreadsheet and the distribution of the diagnoses was analyzed using frequency tables and percentages.

## RESULTS

A total of 3724 outpatient visits were recorded out of which 1468 (39.41%) were strictly neurological. Headache, spondylosis, stroke, epilepsy, peripheral neuropathies and movement disorders were the most frequent diagnoses constituting 28.47%; 18.32%; 14.58%; 9.60%; 8.65%; and 8.17% respectively of the visits to the hospital. Among the patients with headache, tension-type headache was the most frequent diagnosis (41.39%) while migraine headaches constituted 27.99%. The remainder was accounted for by the Trigeminal Autonomic Cephalalgias (especially Cluster Headache) and other unspecified headache syndromes. Ischemic stroke constituted 84.11% of recorded stroke cases while intracerebral hemorrhage made up 4.67%. All were confirmed by neuroimaging studies. About 9.82% of the stroke cases were not specified. Among the degenerative diseases of the spine, cervical spondylosis was the most frequently diagnosed reason for consultations (63.2%). Peripheral neuropathies were mainly extracranial (73.22%) while cranial mono-neuropathies (facial, trigeminal and hypoglossal nerve lesions) constituted 12.6%; 11.82%; and 2.36% respectively. Forty two percent (42%) of the patients with epilepsy were noted to have focal seizures while the remainder was unspecified.

**Table 1:** Neurology Outpatient Cases seen in Lagoon Hospitals over a 3 Year Period

S/No	Disease Category	Total Number of Cases (1468)	Percentage of Total (100%)
1	Cerebral Palsy	5	0.34
2	CNS Infections	27	1.84
3	CNS Inflammation	29	1.96
4	CNS Poisoning	3	0.20
5	Dementia	36	2.45
6	Dizziness and Giddiness	22	1.50
7	Epilepsy	141	9.60
8	Headache	418	28.47
9	Movement Disorders	120	8.17
10	CNS Neoplasms	18	1.22
11	Neuromuscular Diseases	4	0.27
12	Peripheral Neuropathies	127	8.65
13	Somatoform Disorder, unspecified	10	0.68
14	Sleep Disorder	11	0.80
15	Spondylosis	269	18.32
16	Stroke, unspecified	214	14.58
17	Syncope	9	0.61
18	Traumatic Brain Injury	5	0.34

**Table 2:** Headache Visits in Lagoon Hospitals over a Three (3) Year Period

S/No	Headache Type	Total Visits (418)	Percentage of Total (100%)
1	Tension Type	173	41.39
2	Migraines	117	27.99
3	Trigeminal Autonomic Cephalalgias	12	2.87
4	Other headache Syndrome	116	27.75

**Table 3:** Outpatient Stroke Cases seen in Lagoon Hospitals over Three (3) Years

S/No	Stroke Type	Total Visits (214)	Percentage (100%)
1	Cerebral Infarction	180	84.11
2	Intracerebral Hemorrhage	10	4.67
3	Subarachnoid Hemorrhage	3	1.40
4	Stroke Unspecified	21	9.82

**Table 4:** Outpatient Cases of Spondylosis in Lagoon Hospitals over a Three (3) Year Period

S/No	Anatomical Location	Total Visits (269)	Percentage (100%)
1	Cervical	170	63.20
2	Lumbosacral	51	18.96
3	Spondylosis, unspecified	48	17.84

**Table 5:** Outpatient Cases of Peripheral Neuropathy in Lagoon Hospitals over Three (3) Year Period

S/No	Nerve Involved	Total Visits (127)	Percentage (100%)
1	Facial	16	12.60
2	Trigeminal	15	11.82
3	Hypoglossal	3	2.36
4	Peripheral neuropathy, unspecified	93	73.22

**Table 6:** Outpatient Cases of Epilepsy seen over a Three (3) Year Period

S/No	Class of Epilepsy	Total Visits (140)	Percentage (100%)
1	Focal	42	30.00
2	Generalized	15	10.70
3	Epilepsy, unspecified	83	59.30

**Table 7:** Movement Disorders seen in Lagoon Hospitals over a Three (3) Year Period

S/No	Movement Disorder	Total Visits (120)	Percentage (100%)
1	Parkinsonism	48	40.00
2	Dystonia	32	26.66
3	Essential Tremors	31	25.83
4	Myoclonus	2	1.67
5	Others	7	5.83

## DISCUSSION

Clinical practice data from private healthcare institutions in Nigeria is quite sparse and this is more apparent in rare specialties like neurology<sup>10</sup>. This study recognizes headache as the most common reason for outpatient adult neurology consultations in Lagos accounting for more than 28% of all the visits (Table 1). A similar finding has been presented by Tegueu *et al*/from a private urban clinic in Yaounde, Cameroun where headache accounted for 31.9% of all the visits in the adult neurology clinic<sup>16</sup>. In contrast, stroke and epilepsy dominate the neurology clinics in tertiary healthcare institutions in Nigeria which already have a large amount of data identifying stroke as the most commonly admitted neurological disorder<sup>5,11, 15</sup>.

The accurate definition of the type of headache a patient experiences is absolutely relevant to its management (Table 2). While most primary headaches may have characteristic clinical features, the author recommends a low threshold for brain imaging considering the limitations of clinical evaluation. This is certainly practicable when healthcare is insured as obtained for most patients in Lagoon Hospitals. Of equal importance is the use of a "headache diary" which is a very simple clinical tool that helps patients to better define the characteristics of their symptoms with emphasis on the identification of triggers.

Stroke constituted about 14% of the visits to the clinic making it the 3<sup>rd</sup> most common disorder (Table 1). In agreement with other local and international studies, cerebral infarction was the most common type (Table 3), accounting for about eighty four per cent of all cases<sup>1,4,7,14</sup>. Stroke prevention strategies have gained popularity in our environment largely as a result of the increasing popularity of the benefits of cardiovascular fitness.

While acute stroke intervention strategies are more established for ischemic stroke, they are currently not employed in the routine management of patients because very few are eligible at the time of presentation and the cost implications are enormous<sup>17,20</sup>. More emphasis on stroke prevention and the early recognition of stroke are being encouraged by neurologists all over the world to reduce the burden of this illness.

Epilepsy accounted for 9% of the clinic visits in this study and was the 4<sup>th</sup> most reason for clinic visits (Tables 1 and 6). Worldwide, it is a common neurological disorder with a higher incidence and prevalence rates in rural areas, underdeveloped countries and in the pediatric age group<sup>3</sup>. The current study was however carried out in the adult neurology clinic of a private hospital that caters mainly for the middle and high income earners and situated in an urban, cosmopolitan city in Nigeria. It is not surprising therefore that it was more common in the government owned tertiary institutions<sup>12,13,18</sup>. Although the data presented suggests that localization related epilepsies are more common, this classification was based on the clinical diagnosis and not on the patients' EEG results. EEG is routinely offered to newly diagnosed epileptics in our hospital and another study is currently underway to accurately classify these disorders based on clinical and EEG findings.

Movement disorders were the 6<sup>th</sup> most frequent cases seen in our clinic, accounting for about 8% of the total number of visits with Parkinsonism, Tremors and Dystonias topping the charts (Tables 1 and 7). This agrees with the results of Okubadejo *et al* as seen in the Premier Movement Disorders Clinic in Nigeria<sup>9</sup>. While the popularity of this sub-specialty is growing at an international level, more awareness is needed among general practitioners regarding the recognition of the basic features and phenomenology of movement disorders to encourage early initial management and referral.

More collaborative efforts such as exist between the College of Medicine, University of Lagos and the International Parkinson's and Movement Disorder Society (MDS) through conferences and courses organized within the country hope to improve this trend<sup>7</sup>. The Asynchronous Consultations in Movement Disorders (ACMD) is another initiative of the MDS, which is a telemedicine based avenue for cross referrals among doctors all over the world. Strict video recording protocols are employed for consenting patients to ensure standard diagnosis and feedbacks. These and other initiatives will certainly improve the lot of affected patient.

Spondylosis (and other degenerative diseases of the spine) constituted 18% of the total visits and were the second most common disorders treated in the clinic (Table 1). Along with stroke, they constituted a sizeable proportion of the outpatient visits, similar to the findings in other studies<sup>12,16</sup>. The dominance of both disorders in this preliminary study reflects the need for and collaboration between neurologists and other providers of neuro-rehabilitative therapy, especially physical therapy, which is implicit in their management. It

also calls upon investors in healthcare to re-examine the marketability of neuro-rehabilitative services in Nigeria.

## LIMITATIONS

At the time of this study, the available diagnoses obtained from the Electronic Medical Record (EMR) of our hospital were based on the 2014 Version of the ICD 10. However, more recent versions of this internationally accepted method of disease classification offer a wider and more specific array of diagnoses. Also, a significant number of the diagnoses inputted on the EMR were classified as “unspecified”. This suggests that the actual distribution (and frequency) of the specific disease entities may have been under- or over-reported.

## CONCLUSIONS & RECOMMENDATIONS

In the typical outpatient adult neurology practice, stroke, headaches, epilepsies, movement disorders and degenerative diseases of the spine are five commonly seen disorders and therefore the most likely to offer the largest returns for investors in neurology and neuro-rehabilitative medicine. The call for the continuous expansion of the health insurance coverage among Nigerians must continue to be emphasized to guarantee optimum delivery of quality healthcare in our country.

## ACKNOWLEDGMENT:

The Management and Privileging Committee of Lagoon Hospitals Hygeia; Mr. **Adekunle Omidiora** & Mr. **Olusola Omotoso** for providing access the relevant Electronic Medical Records; and **Prof Yomi Ogun** for his kind review of this article and insightful suggestions.

## CONFLICTS OF INTEREST:

None

## REFERENCES

1. AKINYEMI RO. Global Epidemiology of Stroke with Special Reference to Sub-Saharan Africa (SSA). 2016. Lecture delivered at the 8th Regional Teaching Course in SSA, Maputo Mozambique. Available at: [https://www.ean.org/fileadmin/user\\_upload/Akinyemi\\_R\\_\\_Stroke\\_Epidemiology.pdf](https://www.ean.org/fileadmin/user_upload/Akinyemi_R__Stroke_Epidemiology.pdf)
2. BIRABI B, OKE KI, DINEYE PO, OKAFOR UC. Cost Burden of Post Stroke Condition in Nigeria: A Pilot Study. *Glob J Health Sci*. 2012 Nov; 4(6): 17–22. DOI: 10.5539/gjhs.v4n6p17
3. CAMFIELD P, CAMFIELD C. Incidence, Prevalence and Aetiology of Seizures and Epilepsy in Children. *Epileptic Disord*. 2015 Jun; 17(2):117-23. DOI: 10.1684/epd.2015.0736.
4. DESALU OO, WAHAB KW, FAWALE B, OLANREWAJU OT, BUSARI O, ADEKOYA AO, et al. A review of stroke admissions at a tertiary hospital in rural Southwestern Nigeria. *Annals of African Medicine*. 2011; 10(2): 80-85.
5. EKENZE OS, ONWUEKWE IO, EZEALA-ADIKAIKE B. Profile of Neurological Admissions at the University of Nigeria Teaching Hospital, Enugu. *Niger J Med* 2010; 19(4): 19-22
6. Neuro Doctors in Nigeria. Blue Print Nigeria 2014. Accessible at: <https://www.blueprint.ng/neuro-doctors-in-nigeria/>
7. OGUN SA, OJINI FI, OGUNGBO B, KOLAPO KO, DANESI MA. Stroke in South West Nigeria: A 10-Year Review. 2005; 36: 1120-1122.
8. OGUNBEKUN I, OGUNBEKUN A, OROBATON N. Private Health Care in Nigeria: Walking the Tightrope. *Health Policy and Planning* 1999; 14(2): 174–181
9. OJINI F, DANESI M. The Pattern of Neurological Admissions at the Lagos University Teaching Hospital. *Nigerian Journal of Clinical Practice*. 2003; 5(1): 38-41.
10. OKUBADEJO NU. Movement Disorders Overview for Practicing Clinicians. Lagos, Nigeria. 2018. Available at: <https://www.movementdisorders.org/MDS/Education/Upcoming-Courses/Movement-Disorders-Overview-for-Practicing-Clinician-Lagos-Nigeria2018.htm>
11. OKUBADEJO NU, OJO OO, OSHINAIKE OO, BANKOLE IA, AIYEJUSUNLE CB. Spectrum of Movement Disorders at the Premier Lagos Movement Disorders Clinic in Nigeria: First Years' Experience (Abstract).

- Movement Disorders 2012; 27 Suppl 1:16. Available at:  
<http://www.mdsabstracts.com/abstract.asp?MeetingID=787&id=99101>
12. ONWUEKWE IO, EZEALA-ADIKAIIBE B. Prevalence and Distribution of Neurological Diseases in a Neurology Clinic in Enugu, Nigeria. *Ann Med Health Sci Res* Jan 2011; 1(1) 63-68.
  13. OPARAH SK, NJIDEOFOR UN, EZEDINACHI NU. Outpatient Neurological Presentations at a Tertiary Health Facility in Southern Nigeria: A 2 Year Review at the University of Calabar Teaching Hospital. *Pioneer Medical Journal Umuahia*. 2013; 3(6).
  14. OVBIAGELE B, NGUYEN-HUYNH M. Stroke Epidemiology: Advancing our Understanding of Disease Mechanism and Therapy. *Neurotherapeutics*. 2011; 8(3): 319-329.
  15. OWOLABI LF, SHEHU MY, SHEHU MN, FADARE OJ. Pattern of Neurological Admissions in the Tropics: Experience at Kano, Northwestern Nigeria. *Annals of Indian Academy of Neurology*. 2010; 13(3): 167-70. DOI: 10.4103/0972-2327.70875.
  16. TEGUEU CK, NGUEFACK S, DOUMBE J, FOGANG YF, MBONDA PC, MBONDA E. The Spectrum of Neurological Disorders Presenting at a Neurology Clinic in Yaoundé, Cameroon. *The Pan African Medical Journal*. 2013; 14:148. doi:10.11604/pamj.2013.14.148.2330.
  17. VAN WIJNGAARDEN DH, DIRKS M, HUIJISMANN R, NIESSEN LW, FABBRICOTTI IN, DIPPEL DW. Hospital Rates for Thrombolysis in Acute Ischemic Stroke: The Influence of Organizational Culture. *Stroke*. 2009; 40: 3390-3392.
  18. WAMMANDA RD, ONALO R, ADAMA SJ. Pattern of Neurological Disorders Presenting at a Pediatric Neurology Clinic in Nigeria. *Annals of African Medicine*. 2007; 6(2): 73-75. DOI: 10.4103/1596-3519.55712.
  19. World Health Organization (WHO) International Classification of Diseases 10<sup>th</sup> Revision Version 2014. Accessible at: <https://icd.who.int/browse10/2014/en>
  20. ZAHURANEC DB; MAJERSIK JJ. Percentage of Acute Stroke Patients eligible for Endovascular Treatment. *Neurology*. 2012;79 (Suppl 1): S22-S25