

A 3-Year Review of Frequency and Pattern of Movement Disorders in a Neurologic Clinic of a Tertiary Hospital in Nigeria

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Article Submitted: 10th November, 2021. Published 22nd January 2022.

ABSTRACT

Movement disorders are neurological disorders found worldwide with varying forms. They are generally thought to be uncommon in Sub-Saharan Africa because of the relatively large young population. This study evaluated the frequency and pattern of movement disorders in a neurology clinic in a tertiary hospital in North Central Nigeria over a 3-year period. The records of all patients attending Neurology Clinic in Federal Medical Centre, Makurdi, North Central Nigeria were reviewed retrospectively from March 2016 to February 2019, and diagnoses as made by the Neurologist were obtained. Data was analyzed using the Statistical Package for Social Sciences (SPSS) software (IBM SPSS statistics 21). Four hundred patients were seen out of which 49 of them had diagnosis of movement disorders made; giving a frequency of 12.3%. The mean age was 55 (SD = 13.49) years; 35 (71.4%) were males and 14 (28.6%) were females. Hypokinetic movement disorders were 28 (57.1%) while hyperkinetic movement disorders were 21 (42.9%). Twenty eight (57.2%) had Parkinsonism, 6 (12.2%) had dystonia, 6 (12.2%) had essential tremors, 4 (8.2%) had Tics, 3 (6.1%) had chorea and 2 (4.2%) had myoclonus. All the patients with Parkinsonism were on combination treatments namely: Levodopa/carbidopa with Trihexyphenidyl therapy 16 (57.1%) and Levodopa/carbidopa therapy 8 (28.6%). About 6 (50.0%) of dystonia cases were on clonazepam monotherapy; essential tremor, 9 (75.0%) of them were on propranolol monotherapy; tics, 3 (75.0%) of them were on haloperidol and all the 3 patients with chorea were on haloperidol. Parkinsonism is the most common movement disorder seen in our cohort.

Keyword: Frequency, pattern, treatment, movement disorders, North central Nigeria



Article Access

Website: www.wjmb.com

 [10.5281/zenodo.5907187](https://doi.org/10.5281/zenodo.5907187)

How to cite this article

Iwuozo UE, Enyikwola OJ, Mbaave TP, Obiako OR. A 3-Year Review of Frequency and Pattern of Movement Disorders in a Neurologic Clinic of a Tertiary Hospital in Nigeria. *West J Med & Biomed Sci* 2022; 3 (1). 89-95. DOI: [10.5281/zenodo.5907187](https://doi.org/10.5281/zenodo.5907187)

INTRODUCTION

Movement disorders are neurological disorders found worldwide with varying forms. They are generally thought to be uncommon in Sub-Saharan Africa (SSA) because of the relatively large young population in the region.¹ They are characterized phenomenologically by slowness and paucity of movement (hypokinetic disorders) or abnormal excessive involuntary movements (hyperkinetic disorders).²⁻⁴ The hypokinetic movement disorders are exemplified by Parkinson's disease and other parkinsonian disorders like progressive supranuclear palsy, multiple system atrophy and corticobasal degeneration. Hyperkinetic movement disorders include tremors, dystonia, tics, chorea, athetosis, ballism and hemifacial spasm.^{2,4}

The basal ganglia and their connections have been implicated in the pathophysiology of most of the movement disorders, while some such as hemifacial spasm and other peripherally induced movement disorders are caused by altered peripheral input.⁵ The clinical presentation of movement disorders is complex, often variable, and sometimes even bizarre.⁶ Establishing the correct diagnosis can, therefore, be difficult, even in the hands of experienced movement disorder specialists. However, accurate recognition based on clinical acumen is important for appropriate treatment.

Many patients respond well to the use of the various medication options available to relieve the symptoms of movement disorders. Common groups of drugs used to treat Parkinson's disease and other movement disorders include levodopa, dopamine agonists, monoamine oxidase-B antagonists, catechol o-methyltransferase-inhibitors, anticholinergics, amantadine, beta blockers, benzodiazepines, antiepileptic drugs and antipsychotics.^{6,7}

This study evaluated the frequency and pattern of movement disorders in a neurology clinic in a tertiary hospital in North Central Nigeria over a 3-year period. It is anticipated that this report will assist clinicians in identifying common movement disorders with a view to treating or referring them promptly.

MATERIALS AND METHODS

Study design and setting: This descriptive retrospective hospital based study was done among patients with diagnosis of movement disorders made by the Neurologist attending Neurology Clinic in Federal Medical Centre, Makurdi North Central Nigeria over a three year period from March 2016 to February 2019. Ethical approval was obtained from the hospital research ethical committee before study commencement.

Study data collection: Data of patients were included if they were at least 18 years, attending the adult neurology clinic with diagnosis of a movement disorder. Identified patients' case notes were reviewed retrospectively with relevant demographic and clinical information such as age, sex, diagnosis and medications used were extracted into a proforma.

Definition and Diagnostic criteria for movement disorders:

i. **Parkinsonism:** The diagnosis of Parkinsonism was made on the basis of the presence of at least three of the four cardinal features *i.e. tremors, rigidity, bradykinesia, and postural or gait abnormality*. Parkinson's disease (PD) cases fulfilled all United Kingdom Parkinson's Disease Society (UKPDS) Brain Bank criteria and the Movement Disorder Society (MDS) clinical diagnostic criteria for PD.^{8,9}

ii. **Essential tremor:** Patients with essential tremor usually experience uncontrollable shaking (tremor) in the hands, head, voice, or other body parts. The condition usually begins in adulthood and may gradually become worse with age. Tremor is typically most noticeable when holding the hands outstretched or making fine hand movements, such as holding a cup, using a spoon, or writing. The tremor usually stops if the hands/arms are completely relaxed, such as when hands are resting in the lap. Stress often makes the tremor temporarily worse.¹⁰

iii. **Dystonia:** This is a disorder characterized by

- involuntary muscle contractions that cause slow repetitive movements or abnormal postures. These can affect any part of the body, including the arms, legs, trunk, eyelids, face, neck and vocal cords. The movements may be painful, and some individuals with dystonia may have a tremor or other neurological symptoms.¹¹
- iv. Tics: They are brief movements or sounds that resemble voluntary actions, but appear suddenly, without regularity, often exaggerated in intensity and are repetitive and inopportune to social context. Tics also lack behavioral flexibility, which is a characteristic marker for voluntary actions and defines normal human goal-directed behaviour.¹²
 - v. Chorea: This is an abnormal involuntary movement characterized by brief, dance-like, abrupt, irregular, unpredictable, non-stereotyped movements.¹³
 - vi. Myoclonus: This is characterized by sudden, brief, involuntary jerks of a muscle or group of muscles. It can be either a positive jerk caused by a muscular contraction, or a negative jerk caused by an interruption of muscle activity.¹⁴
 - vii. Statistical analysis: Data was coded and analyzed using the Statistical Package for Social Sciences (SPSS) software (IBM SPSS statistics 21). Descriptive statistics was used to compute mean and median (interquartile range) as well as frequencies. Relevant results were presented as figure and table.

RESULTS

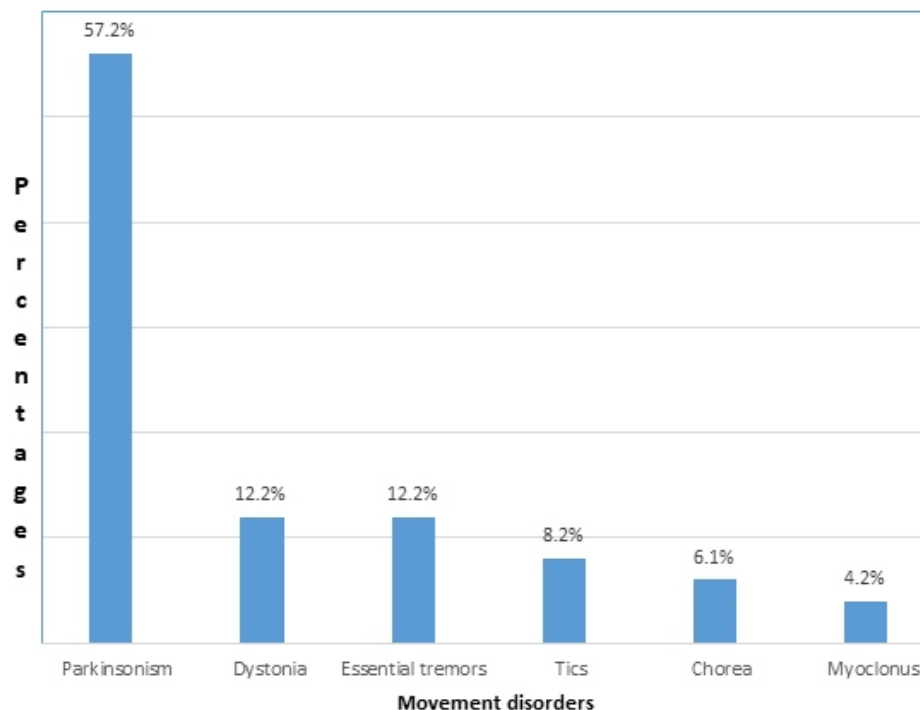


Figure 1: Showing Pattern of Movement Disorders

Frequency and pattern of movement disorder

Four hundred patients with neurological diseases were seen over the study period out of which 49 of them had diagnosis of movement disorders made - with a frequency of 12.3%. The mean age of patients with movement disorders was 55 (SD = 13.49) years; 35 (71.4%) were males and 14 (28.6%) were females. Hypokinetic movement disorder comprised 28 (57.2%) and hyperkinetic movement disorder 21 (42.8%). The twenty eight (57.2%) with hypokinetic movement disorder all had Parkinsonism out of which 4 (8.2%) were atypical Parkinsonism and 24 (49.0%) were Parkinson's disease. In those with hyperkinetic movement disorder, 6 (12.2%) had dystonia, 6 (12.2%) had essential tremors, 4 (8.2%) had Tics, 3 (6.1%) had chorea and 2 (4.2%) had myoclonus as shown in Figure 1 below.

Treatment pattern of movement disorder

All the patients with Parkinsonism were on combination treatments namely:

Levodopa/carbidopa with Trihexyphenidyl therapy 16 (57.1%); 8 (28.6%) were on levodopa/carbidopa combination, and 4 (14.3%) were on the combination of Levodopa/carbidopa plus Trihexyphenidyl plus Amantadine. Among patients with dystonia 6 (50.0%) of them were on clonazepam monotherapy, 4 (33.3%) were on Trihexyphenidyl plus Clonazepam and 2 (16.7%) were on tetrabenazine monotherapy. Concerning patients with essential tremor, 9 (75.0%) of them were on propranolol monotherapy, 2 (16.7%) on clonazepam + propranolol and 1 (8.3%) on propranolol + topiramate. As regards those with tics, 3 (75.0%) of them were on haloperidol and 1 (25.0%) on risperidone. All the 3 patients with chorea were on haloperidol while of the 2 patients with myoclonus, one was on sodium valproate monotherapy and the other was on a combination of sodium valproate and levetiracetam. The treatment patterns are shown in Table 1 below.

Table 1: Treatment Pattern of Movement Disorders

Subtype	Frequency	Percentage
Parkinsonism (n = 28)		
Trihexyphenidyl + Levodopa/carbidopa	16	57.1
Levodopa/carbidopa monotherapy	8	28.6
Amantadine + Trihexyphenidyl + Levodopa/carbidopa	4	14.3
Dystonia (n = 12)		
Clonazepam monotherapy	6	50.0
Trihexyphenidyl + Clonazepam	4	33.3
Tetrabenazine monotherapy	2	16.7
Essential tremor (n = 12)		
Propranolol monotherapy	9	75.0
Clonazepam + propranolol	2	16.7
Propranolol + Topiramate	1	8.3
Tics (n = 4)		
Haloperidol	3	75.0
Risperidone	1	25.0
Chorea (n = 3)		
Haloperidol	3	100.0
Myoclonus (n = 2)		
Sodium valproate monotherapy	1	50.0
Sodium valproate + Levetiracetam	1	50.0

DISCUSSION

The present study found the frequency of movement disorder to be 12.3%. This is comparable to previous studies by Molokwu *et al* in a tertiary health care centre in Enugu, Nigeria who had reported a frequency of 9.11% while Bower *et al* in Addis Ababa, Ethiopia documented 15.1%.^{15,16} Movement disorder in this part of the world is generally poorly recognized and under-reported by clinicians due to non-availability of Neurologists and movement disorder specialists in many hospitals. There is also a huge negative perception about the disorder which could make sufferers to seek alternative care instead of presenting to the hospital.

The mean age of our study participants was 55 years with 71.4% being males. Male preponderance among patients with movement disorders have been documented by some previous researchers.^{16,17} This is in contrast to a study in Brazil by Balestrassi *et al* (2021) which reported female preponderance as in their cohort 58.4% of them were females.¹⁸ Hypokinetic movement typified by parkinsonism (57.2%) was the most common movement disorder studied out of which 49.0% had Parkinson's and 8.2% had atypical Parkinsonism. This is consistent with finding by several other researchers within and outside the country.^{15,16,18,19} Parkinson's disease is the most common neurodegenerative cause of parkinsonism. Other causes include multiple system atrophy, progressive supranuclear palsy and corticobasal degeneration.²⁰ Parkinsonism can also be symptomatic, as a result of various vascular, drug-related, infectious, toxic, structural and other known secondary causes.²⁰

Other movement disorders found were: essential tremor (12.2%), dystonia (12.2%), tics (8.2%), chorea (6.1%) and myoclonus (4.2%). This pattern is similar to reports by several previous authors.^{15,16,18,19}

Levodopa has remained the cornerstone of Parkinson's disease treatment for more than 50 years. However, after a few years of treatment and mainly due to the progression of the disease, the benefit of levodopa

shortens and motor complications appear in many patients.²⁰ Patients with atypical parkinsonism do not respond well to levodopa/carbidopa treatment and generally have a worse prognosis compared to typical Parkinson's disease.²¹ About 57.1% of our patients with parkinsonism were on Levodopa/carbidopa plus trihexyphenidyl combination while 28.6% were on Levodopa/carbidopa combination and 14.3% were taking a combination of Levodopa/carbidopa plus trihexyphenidyl plus amantadine.

In dystonia there is a relentless sustained repetitive muscular contraction leading to abnormal fixed postures. Muscle relaxants like clonazepam and anticholinergics such as trihexyphenidyl, benzotropine and medications primarily affecting the dopaminergic system such as levodopa and tetrabenazine are the main treatment modality.²² Among patients with dystonia in our cohorts, about 50.0% of them were on clonazepam monotherapy and 33.3% were on clonazepam and trihexyphenidyl while 16.7% of them were on tetrabenazine.

According to the American Academy of Neurology guideline, the high blood pressure drug propranolol and the drug primidone, which is used to treat seizures, are the most effective at improving shaking in people with essential tremor while other agents like topiramate, clonazepam could also be used.²³ Majority (75.0%) of our cohorts with essential tremor were on propranolol monotherapy. About 16.7% of them were on clonazepam and propranolol while 8.3% were on topiramate and propranolol.

According to the practice guideline recommendation from the American Academy of Neurology for the treatment of tics disorders, options includes the use of alpha agonist like clonidine, guanfacine and antipsychotics like haloperidol, risperidone and aripiprazole.²⁴ Tics disorder among our patients were treated with haloperidol in 75.0% and risperidone in 25.0% of them. All (100.0%) of the patients with chorea received haloperidol. Myoclonus can be the cause of significant disability among the sufferers.²⁵ Myoclonus

occurs via many different etiologies and basic pathophysiological mechanisms.²⁶ Classification by both etiology and physiology is necessary to optimize the treatment strategy.²⁵ Commonly recommended drugs are levetiracetam, sodium valproate and clonazepam.²⁵ Among those with myoclonus, 50.0% of them were on sodium valproate monotherapy while 50.0% of them were receiving a combination of sodium valproate and levetiracetam.

CONCLUSION

The frequency of movement disorder in our environment is similar to previous reports with Parkinsonism been the most common. The high frequency of movement disorder indicates a need for training of movement disorder specialist in Nigeria and the provision of basic drugs for managing affected persons.

Recommendation

There is a need for a prospective study in our environment to determine the treatment outcome of movement disorders.

Limitations

Our study is retrospective in nature and has certain limitations like missing records and information. Also because it was carried out in an adult neurology clinic, movement disorders that are common in children were not studied. We equally did not attempt to give a detailed characterization of our Parkinson disease patients. However, this study has given insight into the common forms of movement disorders in our clinic and their treatment modality.

Acknowledgement

We sincerely appreciate the medical record and nursing staff in Medical Outpatient Department (MOPD) of Federal Medical Centre Makurdi, Benue State for their assistance in retrieving patients' case notes.

Conflict of interest

The authors declare no conflict of interest.

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