Clinical Profile of Parkinson’s Disease in Calabar, Southern Nigeria

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ABSTRACT

This study aims to describe the clinical profile of Parkinson’s disease as encountered in an institutional based outpatient neurology practice in Calabar, southern Nigeria. In addition to bedside clinical examination, we used a structured interviewer-administered questionnaire to generate a database of patients with Parkinson’s disease, recruited by a convenience sampling method over a three year period, during their initial presentation at the neurology clinic in the city. The demographics, symptoms and other characteristics of Parkinson’s disease seen in the participants were documented in this cross-sectional study. Forty two new patients with Parkinson’s disease were recruited, comprising 25 (59.5%) males and 17 (40.5%) females, with mean age of 65.7 years ± 11.77 and mean age at onset of 62.4 years ± 12.68. Duration of symptoms ranged from three months to 22 years, with sex-specific mean values of 4.1 years ± 4.39 and 1.9 years ± 0.97 for the male and female patients, respectively (p=0.023). Tremor (97.6%) and rigidity (83.3%) were the top motor symptoms. Many of the respondents, 78.6% had non-motor symptoms, with constipation (40.5%) and Rapid Eye Movement (REM) sleep disorder (40.5%) as the most common. Parkinson’s disease in Calabar is tremor dominant, with onset within the seventh decade of life. Constipation and REM sleep disorders are the top non-motor manifestations. Early clinic presentation is uncommon, especially among the male patients.

Keywords: Clinical profile, Parkinson’s disease, rigidity, tremors

INTRODUCTION

Parkinson’s disease is one of the most common degenerative neurological diseases. Its prevalence increases with age and it is regarded to be less common in people of black African descent compared to other races. 1 The condition presents with motor manifestations including: tremors, bradykinesia, rigidity and postural instability, in addition to other less known motor symptoms. 2 Furthermore, non-motor symptoms of Parkinson’s disease have increasingly assumed clinical relevance in the management of this progressively debilitating condition with appreciable adverse impact on the overall quality of life of the affected persons. 3,4 Despite the low prevalence of Parkinson’s disease reported in sub Saharan Africans, it is recognized to be the most common form of movement disorder in Nigeria. 5,6 Under-diagnosis of the disease as a result of failure to seek orthodox medical care by affected persons and lack of timely recognition by clinicians, variations in population age structure from reduction in the proportion of the elderly occasioned by lower life expectancy, and a low volume of published reports, are some of the factors posited as contributors to the low prevalence in sub Saharan Africa. 7 In view of the changing nature of health challenges as a result of globalization and migration dynamics, knowledge of the pattern and peculiarities of disease burden in diverse regions enhances the approach to effective disease management and intervention measures. Reports from the western and, to a lesser extent, northern regions constitute a majority of the available few reports on Parkinson’s disease from Nigeria;
the most populated African nation with diverse ethnicities, cultural practices and probably varied genetic characteristics. There is a dearth of reports from the south eastern part of Nigeria especially from the Niger delta areas of the south eastern geographic region of Nigeria. In addition to generating a database, this study aims to describe the clinical characteristics and highlight the peculiarities of Parkinson’s disease patients in the city of Calabar, located in the southeastern region of Nigeria. Although the clinical features of Parkinson’s disease are well known, patients exhibit variations in the prominence of component symptoms of the condition. Hence, the use of terms such as “tremor dominant” to describe the peculiarity of Parkinson’s disease presentation. This has implications for the symptomatic treatment of the disease, as some medications differentially impact on features of the disease. Moreover, the rate of disease progression in Parkinson’s disease has been linked to the dominant symptom.5

PATIENTS AND METHODS

This study was conducted from July 2015 to July 2018 at the University of Calabar Teaching Hospital, which hosts the sole neurology clinic in the city of Calabar in south eastern Nigeria. It is noteworthy that the hospital which served as the study location harbours the only specialist neurology clinic in the city. The aforementioned clinic, which is manned by three consultant neurologists and six senior and junior resident doctors in training, receives almost all the referrals of neurology cases in the city and adjoining areas. The city, located at latitude 4°58”N and longitude 8°17”E, is a major tourist destination in the country. The 2006 national population census puts the total population of Calabar at 371,122.10
Ethical approval for this descriptive cross sectional study was obtained from the Research and Ethics committee of the University of Calabar Teaching Hospital (UCTH/HREC/33/479), and the process conducted in agreement with the Helsinki declaration of 1975, as revised in 1983.

Using a convenience sampling method, participants were drawn from consecutively presenting patients with a diagnosis of Parkinson’s disease, during their initial presentation at the adult neurology clinics of the teaching hospital. Assessment of the participants in the study was based on reported symptoms and physical examination findings elicited by specialist physicians. The study involved only those with a diagnosis of Parkinson’s disease; defined as a presentation with motor features of parkinsonism in addition to lack of any identifiable secondary cause of parkinsonism, absence of atypical features and asymmetry of symptom manifestations at the initial stage. Persons diagnosed with other forms of Parkinsonism were not included in this study. Information was obtained from consenting participants using a semi structured interviewer administered questionnaire by the attending neurologist during their first clinic consultations.

Information on the demographics characteristics of the participants, symptoms and other characteristics of the Parkinson’s disease manifestations were obtained. The reported age of the participant at the beginning of the motor manifestations of Parkinson’s disease was recorded as the age at onset. The time interval between the onset of the motor symptoms of Parkinson’s disease to the time of presentation at the neurology clinic was regarded as the duration of illness. The Hoehn and Yahr scale for Parkinson’s disease was used to measure the severity of the disease.

Data was analysed using version 20 of the Statistical Package for Social Sciences (SPSS) software. Means and standard deviation (SD), median and ranges were used for continuous variables, and simple proportions were used for categorized data. Independent sample t test and bivariate analysis were used to compare numerical variables and explore associations between variables, respectively. The level of significance was set at p<0.05.

RESULTS

A total of 42 participants were recruited, comprising 25 (59.5%) male and 17 (40.5%) female new patients diagnosed with Parkinson’s disease, during the study period. The mean age of the participants at the onset of Parkinson’s disease was 65.7 years; SD = 11.77. The minimum and maximum ages of the participants, at presentation, were 42 years and 93 years, respectively. The duration of the symptoms of Parkinson’s disease prior to seeking specialist medical help ranged from 3 months to 22 years, with a mean duration of 3.2 years; SD = 3.58. See table 1.

At the time of first clinic presentation; 28.6%, 64.3% and 7.1% of the participants were at stages I, II and III of the Hoehn and Yahr scale of disease severity, respectively. None of them had Hoehn and Yahr stage IV or V disease.
All the participants presented with motor manifestations of Parkinson’s disease, whereas 78.6% of them had at least one non motor symptom feature of the disease. The most frequent motor symptoms of tremors and rigidity were seen in 97.5% and 83.3% of the participants respectively. See table 2.

Non-motor symptoms of constipation and REM sleep behavioural disorder, which were the most common, were identified in 40.5% of the participants, respectively (Table 3).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Male (%)</th>
<th>Female (%)</th>
<th>Total (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of participants</td>
<td>25 (59.5)</td>
<td>17 (40.5)</td>
<td>42 (100)</td>
<td>0.251</td>
</tr>
<tr>
<td>Mean age in years (SD)</td>
<td>65.4 (12.82)</td>
<td>68.3 (9.87)</td>
<td>65.7 (11.77)</td>
<td>0.023</td>
</tr>
<tr>
<td>Age range in years</td>
<td>42 – 93</td>
<td>43 – 86</td>
<td>42 – 93</td>
<td>0.107</td>
</tr>
<tr>
<td>Mean age of onset in years (SD)</td>
<td>59.8 (13.66)</td>
<td>66.2 (10.29)</td>
<td>62.4 (12.68)</td>
<td>0.023</td>
</tr>
<tr>
<td>Mean duration of illness in years (SD)</td>
<td>4.1 (4.39)</td>
<td>1.9 (0.97)</td>
<td>3.2 (3.58)</td>
<td>0.023</td>
</tr>
<tr>
<td>Range of duration in years</td>
<td>0.4 – 22</td>
<td>0.25 – 3</td>
<td>0.25 – 22</td>
<td></td>
</tr>
</tbody>
</table>

SD = Standard deviation

Table 2. Identified non-motor manifestations of Parkinson’s disease at time of presentation

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Total participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constipation</td>
<td>40.5%</td>
</tr>
<tr>
<td>RBD</td>
<td>40.5%</td>
</tr>
<tr>
<td>Hypo/anosmia</td>
<td>16.7%</td>
</tr>
<tr>
<td>Memory deficits</td>
<td>14.3%</td>
</tr>
<tr>
<td>Insomnia</td>
<td>11.9%</td>
</tr>
<tr>
<td>Visual hallucinations</td>
<td>11.9%</td>
</tr>
<tr>
<td>Dizziness</td>
<td>11.9%</td>
</tr>
<tr>
<td>Nightmares</td>
<td>4.8%</td>
</tr>
<tr>
<td>Hyperhydrosis</td>
<td>4.8%</td>
</tr>
<tr>
<td>Fear/ anxiety</td>
<td>4.8%</td>
</tr>
<tr>
<td>Depression</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

RBD = Rapid eye movement (REM) sleep behavioural disorder

Among the participants who presented with Hoehn and Yahr stage I disease, 66.7% had at least one non-motor feature, 41.7% had features of REM sleep behavioural disorder, whereas constipation and Hypo/anosmia respectively, were seen in 25% of them. Non-motor symptoms were seen in 81.5% and 100% of the participants who presented with Hoehn and Yahr stages II and III stages of Parkinson’s disease, respectively. Memory deficit was reported in 8.3%, 11.1% and 66.7% of patients who presented with stages I, II and III, respectively (p=0.026). As high as 90.9% of the participants who had non-motor features were identified among those within the initial two stages of Parkinson’s disease.

DISCUSSION

The low yield of only 42 new patients with Parkinson disease in our study which spanned a period of 3 years, conducted at the sole neurology clinic in the city and entire state, could be attributed to reported low prevalence rate of Parkinson disease in sub-Saharan black Africans. There were more males than females who presented with Parkinson’s disease during the period of our study; an observation in keeping with the experience of other investigators, although we obtained a comparatively less degree of male preponderance.6,9,11,12 The observed trend in clinic presentations in which the female participants tended to present earlier than the males, in our study, might have contributed to blunt the extent of male preponderance, compared to some other observations.6,13 We believe our observation to be a reflection of the widely reported male preponderance among persons with Parkinson’s disease.6,13 It has been suggested that oestrogen confers some degree of protection in women, and is thought to exert some protective influences on dopaminergic nerve terminals and dopamine transporter affinity, leading to the reduction of nigrostriatal degeneration.13,14

The mean age of onset in our study lay within the seventh decade of life as documented in reports by other investigators in the south-western Nigeria; but, a decade higher than the report from the northern region.6,9 However, we did not observe any gender difference in age of onset reported by one of the studies from the south western part of Nigeria.6

A great proportion of the participants in our study did not seek specialist medical care until the symptoms had progressed to involve the contra lateral side (grade II stage of the Hoehn and Yahr scale); a trend similar to the reported experience from other regions.4,7 When this is considered alongside the mean time interval of over three years, between onset of symptoms of Parkinson’s disease and presentation at the neurology clinic, credence is lent to the opinion of earlier investigators who identified delayed presentation to pose a significant challenge to the optimal management of persons with Parkinson’s disease in the African continent.9,15 Lack of prompt recognition stemming from a low index of suspicion on the part of referring healthcare providers, and the tendency to perceive neurologic disorders as part of normal
Ageing in African societies are some of the factors which contribute to delays in clinic presentation of affected persons.\textsuperscript{7} Furthermore, it has been documented that elderly blacks are less inclined to seeking medical attention.\textsuperscript{15} Tremors were the most common motor symptom of Parkinson`s disease observed in our study. This agrees with the review by Jankovic who identified tremors as the most common and readily recognized symptom of the disease.\textsuperscript{2} The next most frequent motor manifestations in our study were; rigidity, bradykinesia and problems with gait and posture. This trend was not surprising as the afore listed motor symptoms are regarded as the cardinal features of Parkinson`s disease.\textsuperscript{2}

In our study, about four fifths of the participants had non-motor symptoms of Parkinson`s disease; with constipation and REM sleep behavioural disorder as the most common, followed by Hypo/anosmia. The occurrence of non-motor symptoms as part of the manifestations of Parkinson`s disease has been robustly described across the globe.\textsuperscript{16-19} Non motor symptoms tend to be largely unrecognized by clinicians despite observations that the burden of such symptoms has a strong correlation with the health related quality of life in persons with Parkinson`s disease.\textsuperscript{3,4,20-22} It is noteworthy that the three most common non motor symptoms identified in our study are components of a suggested battery of tests to identify populations at risk of Parkinson`s disease. This arises from analyses of data from studies such as the Honolulu Asia ageing study.\textsuperscript{22,23}

It is held that these non-motor features may predate the motor manifestations of Parkinson`s disease. Braak and his colleagues had categorized the effects of Parkinson`s disease on the brain into six stages progressing in a caudal to rostral direction. During the initial two stages thought to occur before the motor manifestations, pathological changes are seen in the olfactory bulb and caudal portion of the brain stem. Features here include loss of the sense of smell and sleep disturbances. The substantia nigra pars compacta is said to be affected during the third and fourth stages with manifestation of motor features. The last two stages involve pathological changes in the limbic system and neo-cortex with hallucinations and cognitive deficits as the additional clinical manifestations.\textsuperscript{24}

In this study, we observed that the presence of non-motor symptoms was robustly documented, even in patients who presented at the first stage of the Hoehn and Yahr scale of Parkinson` disease. The increased occurrence of memory deficit with increasing disease severity, observed in our study, corroborates reports of a direct relationship between increasing memory deficit and advancing stages of Parkinson`s disease.\textsuperscript{25-27}

**CONCLUSION**

We conclude that the age of onset for Parkinson`s disease in the Calabar area of south eastern Nigeria, was within the seventh decade of life. Tremor was the dominant motor symptom of Parkinson`s disease in the region. Non-motor manifestations of Parkinson`s disease were prevalent at the time of initial hospital presentation of affected persons in Calabar, with constipation and REM sleep behavioural disorder identified as the most common non-motor symptoms. Optimal management of Parkinson`s disease in the area was confronted with the problem of late presentation.

**RECOMMENDATION**

We recommend that physicians involved in the management of Parkinson disease patients in the areas around Calabar should endeavour to search for presence of non-motor features, especially constipation and REM sleep behavioural disease, even in patients who present at the early stages of the disease. Furthermore, with the observation of tremors and rigidity as the most frequent symptoms of Parkinson disease in the area, the absence of both symptoms in a case of Parkinsonism makes the diagnosis less likely.

**LIMITATIONS**

The study is a hospital based study fraught with selection bias. The hospital does not have the facility for autonomic spectral analysis; hence, we did not employ the use of ancillary investigations and procedures such as autonomic battery evaluation, which could have yielded more detailed findings.

**ACKNOWLEDGEMENTS**

We wish to acknowledge the contributions of the medical records and nursing staff of the adult neurology out-patient clinic at the University of Calabar Teaching Hospital, during the collection of data.

**Conflict of Interests**

None declared.
REFERENCES


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