Physical Anthropology 1 – 4

Parkinson's disease in North Karnataka

An epidemiological perspective

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Abstract:

Parkinson's disease (PD) is a progressive disorder of the brain. It occurs when certain neurons in substantia nigra die or become impaired. Parkinson's disease is characterized by progressively increasing stiffness all over body, tremor in limbs with difficulty in walking. Parkinson's disease usually starts at old age and slowly progresses over a period of time. A total of 557 patients belonging to both rural and urban areas of north Karnataka were interviewed with a structured questionnaire. All the patients were subjected to clinical examination and relevant laboratory investigations. Clinical and demographic data were presented as percentage distribution in the total subjects. The present study revealed that men were affected more than women. The occurrence of Parkinson disease is higher among subjects with no family history when compared the subjects with positive family history. Among the study subjects, approximately 90.8% of the patients were having tremors, followed by slowness in activities (32.7%) and dyskinesia (8.1%). As there is no definitive test for the diagnosis of PD, the disease must be diagnosed based tremor, bradykinesia and rigidity. Innovative community outreach programmes need to be designed and implemented for creating awareness, early screening and treatment of Parkinson's disease.

Introduction

Parkinson's disease (PD) is a progressive disorder of the brain. Parkinson's disease occurs when certain neurons in substantia nigra die or become impaired. Parkinson's disease is characterized by progressively increasing stiffness all over body, tremors in limbs with difficulty in walking. Parkinson's disease usually starts at old age and slowly progresses over a period of time. It is estimated that about 1% of population above the age of 65 years and about 5% above the age of 80 years suffer from PD. Based on this, in India, approximately 7 million individuals will suffer from PD. The alarming rise in the prevalence of Parkinson's disease in India has been attributed to the demographic pattern, changing environment as well as lifestyle (Tan et al., 2004). The projected rise in the prevalence of Parkinson's disease is linked to socioeconomic status (Lix et al., 2010). The Parsi community of Mumbai, India has a prevalence of Parkinson's Disease of 328.3 per 100,000 population (Bharucha et al., 1988), which is almost in excess of that found in Nebraska. This is despite India as a whole having a low prevalence (Behari et al., 2002).

North Karnataka with its unique culture, customs and sociodemographic factors is conductive to the occurrence

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of Parkinson disease, including population growth, demographic pattern, occupational shifts with high proportion of individuals engaged in sedentary lifestyle and substantially higher proportion of pre-obese and obese individuals. In an effort to obtain the clinical characteristics of PD, the present study was undertaken in urban and rural areas of north Karnataka.

Methods

Patients visiting neurology department of various hospitals of Hubli and Belgaum with the symptoms of the parkinson's disease during 2009 to 2011 were included in the present study. A total of 557 patients belonging to both rural and urban area of north Karnataka were the source of the samples. All the subjects were interviewed with the help of a structured, pretested questionnaire. This was followed by clinical examination and relevant laboratory investigations. Standard definitions were used to measure the physical activity, tremour, rigidity, bradykinesia and akinesia (Karimi et al., 2008). Muscle strength, control, reflexes, sensation and vision were evaluated using simple tests. The data displayed in the tables is percentage of items that fall under certain criteria.

Results

A total of 557 subjects (361 men and 196 women) with parkinson's disease were included in the study. Of the 557 subjects 359 were sporadic, 191 were idiopathic and 7 were familial parkinson's diseases cases. Majority of the subjects were from urban region (67.1%) and rural patients comprise only 32.9%. Segregation of the subjects based on the community revealed that the Hindu lingayat constituted (47.6%) followed by Brahmin (15.1%) and Muslims (10.6%) (Table 1). Age distribution of Parkinson patients showed that the majority of the cases were in the age group of 60 to 79 years (54.2%) followed by 40 to 59 years (37.2%). Patients in the age of 20 to 39 years and 80 to 92 years were very less (Table 2). Clinical features of parkinson's disease in the study subjects is documented in table 3. Approximately 90.8% of the patients were having tremors, 32.7% of individuals exhibited slowness in activities and 8.1% of the patients showed dyskinesia. The other features such as walking difficulty, bradykinesia, rigidity, weakness, frequent falls and difficulty in speech were found in less than 5% of the patients (Table 3).

Table 1: Baseline characteristics of Parkinson patients in the study population.

Characteristic feature	n (%)
Male	361 (64.8)
Female	196 (35.2)
Sporadic	359 (64.5)
Idiopathic	191 (34.3)
Familial	7 (1.3)
Urban	374 (67.1)
Rural	183 (32.9)
Lingayat	265 (47.6)
Brahmin	84 (15.1)
Muslim	59 (10.6)
others	149 (26.8)

Table 2: Age distribution of Parkinson patients in the study population.

Age (years)	n (%)
20 to 39	16 (2.9)
40 to 59	207 (37.2)
60 to 79	302 (54.2)
80 to 92	32 (5.7)

Table 3: **Clinical features of Parkinson Disease n=557 (%)**

	Parameter	n (%)
1.	Tremors	506 (90.8)
2.	Slowness in Activities	182 (32.7)
3.	Dyskinesia	45 (8.1)
4.	Walking difficulty	29 (5.2)
5.	Bradykinesia	20 (3.6)
6.	Rigidity	19 (3.4)
7.	Weakness	15 (2.7)
8.	Frequent Falls	3 (0.5)
9.	Difficulty in Speech	1 (0.2)

Discussion

The present study revealed that more men are affected than women. The occurrence of Parkinson disease was higher among subjects with no family history when compared to the subjects with positive family history. Among the study subjects, approximately 90.8% of the patients were having tremors, followed by slowness in activities (32.7%) and dyskinesia (8.1%). Only few patients showed walking difficulty, bradykinesia, rigidity, weakness, frequent falls and difficulty in Speech. In general, a higher incidence of PD was found in males compared to females because of biological and social differences (Roland et al., 2011; Wooten et al., 2004). However, reports suggest that females experience increased freezing of gait as compared to males with PD. Furthermore, dynamic balance was reduced in females compared to males with PD (Roland et al., 2011).

In fact, excess of PD was noted in rural agricultural areas and noted an association between rural residence and well water consumption and PD was observed (Golbe et al., 1990; Ho et al., 1989), but other scholars have not supported this (Seidler et al., 1996; Semchuk et al., 1991). Our study has not observed any rural environmental risk factors, and as such the number of cases referred to the hospitals from rural areas is less than the urban areas indicating that the rural environment is not a risk factor for Parkinson's disease in North Karnataka region. The prevalence of Parkinson's disease per 100,000 of population for different countries is reviewed in several papers (Andlin-Sobocki et al., 2005). However, the prevalence of PD in Asian countries was slightly lower than that in Western countries (Muangpaisan et al., 2009; Muangpaisan et al., 2011).

The chief clinical features observed in the patients in the present study were tremors (90.8%) because the rest tremor is the most common and easily recognized symptom of PD. The occurrence of rest tremor is variable among patients and during the course of the disease. Approximately 11% of the patient with Parkinson's disease, never exhibited tremor (Martin et al., 1973), but a study with autopsy proven disease reported that 100% of patients will experience tremor at some point of their disease (Rajput et al., 1991). In another study it is reported that, at disease onset 69% of patients had rest tremor and during the course of their disease the tremors increased to 75% (Hughes et al., 1993). On the other hand, 8.1% patients exhibited dyskinesias. Several studies have shown that levodopa induced dyskinesias is more in younger patients than the older patients (Jankovic and Stacy, 2007). As there is no definitive test for the diagnosis of PD, the disease must be diagnosed, based on tremor, bradykinesia and rigidity.

Specific presentation of these features is used to differentiate PD from other movement disorders. It is necessary to adopt appropriate prevention strategies and interventions in high risk individuals to curb the growing epidemic of Parkinson disease. Innovative community outreach programmes need to be designed and implemented for creating awareness, early screening and treatment of Parkinson disease.

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