

## Original Research Article

# A clinico-epidemiological profile of Parkinson's disease patients attending the tertiary care hospital of hilly state of North India: a hospital based cross-sectional study

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## ABSTRACT

**Background:** Parkinson's disease (PD) is a neurodegenerative disorder, with male preponderance. It is associated with both motor and non-motor symptoms, which affect quality of life in elderly people. Due to paucity of studies on its epidemiology and prevalence, this disease needs assiduity and further exploration.

**Methods:** A hospital based cross-sectional study was conducted in the tertiary care hospital, among 45 patients diagnosed with PD.

**Results:** The mean age of the participants was  $61.17 \pm 12.30$  years, with male to female ratio was 2:1. The average age of onset of PD was  $57.4 \pm 12.30$  years. Tremor was the most common initial symptom (68.88%) followed by rigidity (20%) and bradykinesia. Most of the patients (86.66%) had progressive symptoms, and 69% had unilateral involvement of limbs.

**Conclusions:** The profile of patients with PD in Himachal Pradesh is similar to that from other populations in India and other developing countries. However, the dearth of studies and data pertaining to PD, invigorate the need to explore this neurodegenerative disorder to comprehend its clinic-epidemiological profile in our state.

**Keywords:** Parkinson's disease, Hospital based study, Cross-sectional

## INTRODUCTION

Parkinson's disease (PD) is a neurodegenerative disorder characterised by tremors, rigidity and difficulty with walking, balance, co-ordination in the body. The symptoms begin gradually and get worsen with time. With the progression of disease, people may face difficulty walking and talking. Besides, they may also experience mental and behavioural changes, sleep problems, depression, memory difficulties, and fatigue. The disease has male preponderance, affecting nearly 50% men than women. Age has been observed as one of

the clear risk factors associated with PD. Most of the people with develop the disease at about 60 years of age; however, about 5 to 10% may have 'early-onset' disease, before the age of 50.<sup>1</sup>

The dopamine deficiency in the basal ganglia leads to classical parkinsonian motor symptoms viz, bradykinesia, tremor, rigidity and later postural instability. PD is also associated with non-motor symptoms, which may precede motor symptoms by more than a decade. These non-motor symptoms become troublesome symptoms in the later stages of PD.<sup>2</sup>

Globally, in 2016, 6.1 million individuals had PD, compared with 2.5 million in 1990.<sup>3</sup> In comparison to other countries, the prevalence of PD in India is less. The total burden of PD is much higher as a result of large population.<sup>4</sup>

The prevalence of PD was found to be 67.7 per 100,000 individuals in an explorative study done among the north Indian population, with male/female ratio of the disease being 2.66.<sup>5</sup>

There is paucity of studies done on PD in our country. Very few centres are engaged in this research. So, with this background in mind, the present study is an attempt to study the clinico-epidemiological profile of PD patients attending the tertiary care hospital of hilly state of North India.

**METHODS**

*Study design and setting*

A hospital based observational cross-sectional study, conducted in the department of medicine and neurology, Indira Gandhi Medical College, Shimla.

*Study methodology*

A total of 45 patients of PD diagnosed by a neurologist or those who were admitted or attended neurology and medicine OPD from June 2016 to May 2017 were enrolled in the study. The demographic data and clinical signs and symptoms were recorded. Hoehn and Yahr scale was used to assess the severity at presentation.

*Statistical analysis*

Data was collected and entered in Microsoft excel spread sheet, cleaned for errors and analysed using Epi info software. Descriptive statistics were used to summarize the demographic data. Frequencies, percentages were used to describe categorical variables. For continuous variables, mean and standard deviations were calculated.

*Ethical consideration*

The patients involved in the research informed and consent was taken from all the participants. Every precaution was taken to respect the privacy of the patient, the confidentiality of the patient’s information and to minimize the impact of the study on his/her physical and mental integrity and his/her personality. Study was carried out after taking due permission from Institutional Ethics Committee of Indira Gandhi Medical College Shimla.

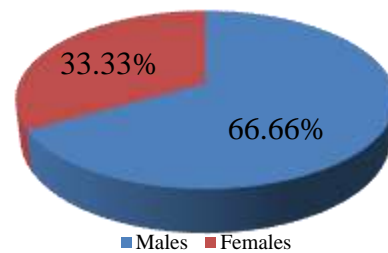
**RESULTS**

Of 45 patients enrolled in the study, male to female ratio was 2:1 (Figure 1). The mean age of the participants was

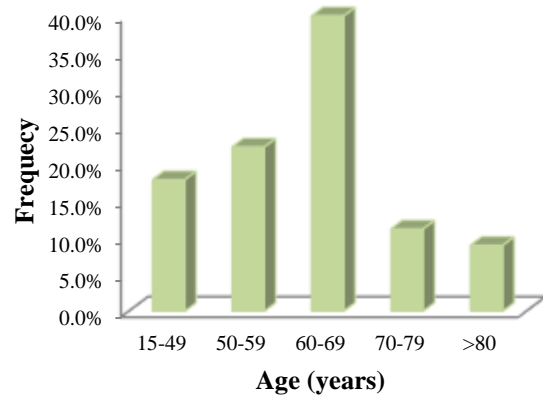
61.17±12.30 years (range of 34-89 years) and nearly 65% participants were from rural background. Most of the patients (40%) were in the age group of 60-69 years who presented with PD (Figure 2).

The average age of onset of PD was 57.4±12.30 years. The duration of symptoms prior to presentation was quite variable, ranging from 3 months to 15 years.

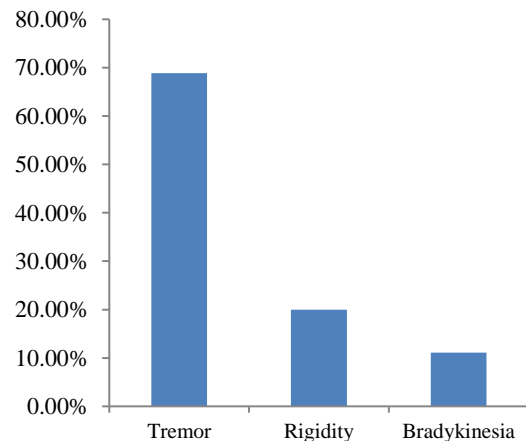
Tremor was the most common initial symptom (68.88%) followed by rigidity (20%) and bradykinesia (11.11%) (Figure 3). Most of the patients (86.66%) had progressive symptoms, and 69% had unilateral involvement of limbs.



**Figure 1: Gender wise distribution of participants.**



**Figure 2: Age wise distribution of participants.**



**Figure 3: Symptoms of PD at onset.**

The different signs observed in patients has been summarised in Table 1. Out of 45 patients 24 patients underwent MRI/CT brain. 12 of them had normal MRI/CT brain and 12 were abnormal. Abnormal findings include encephalomalacia, gliosis, diffuse cerebral atrophy, microangiopathic changes, generalised cerebellar and cerebral atrophy, age related cortical atrophy. MRI report showed findings consistent with PD.

Maximum number of patients in our study presented with duration of symptoms less than 5 years and most patients with duration of symptoms between 0-5 years were in Hoehn and Yahr stage 1 which may indicate the degree of severity of the disease with increasing duration of symptoms. The assessment of the severity at presentation was done using Hoehn and Yahr staging (Table 2).

**Table 1: Presentations of patients with Parkinson's disease.**

| Presentation              | Number of patients (N) | Frequency (%) |
|---------------------------|------------------------|---------------|
| Parkinsonian gait         | 33                     | 73.3          |
| Stooped posture           | 25                     | 55.5          |
| Speech changes*           | 17                     | 37.8          |
| Micrographia              | 19                     | 42.2          |
| Forgetfulness             | 15                     | 33.3          |
| Excessive salivation      | 11                     | 24.4          |
| Dysphagia                 | 3                      | 6.7           |
| <b>Autonomic symptoms</b> |                        |               |
| Constipation              | 16                     | 35.5          |
| Sweating                  | 4                      | 8.9           |
| Urinary incontinence      | 5                      | 11.1          |
| Recurrent UTI             | 5                      | 11.1          |
| Decreased libido          | 2                      | 4.4           |
| Mask like facies          | 31                     | 68.9          |
| Decreased eye blink       | 31                     | 68.9          |

Note: \*decrease volume of the voice, slowness of speech, monotonous speech, slurred speech.

**Table 2: Duration of symptoms and Hoehn and Yahr staging of severity.**

| Duration of symptoms (years) | Hoehn and Yahr's stages |         |         |         |         |
|------------------------------|-------------------------|---------|---------|---------|---------|
|                              | Stage 1                 | Stage 2 | Stage 3 | Stage 4 | Stage 5 |
| 0-5                          | 18                      | 12      | 5       | 2       | 0       |
| 6-10                         | 1                       | 1       | 3       | 0       | 1       |
| 11-15                        | 0                       | 0       | 2       | 0       | 0       |

## DISCUSSION

The mean age of participants in our study was 61.17±12.30 years. Male to female ratio was 2:1. In most studies, it has been found that women have lesser prevalence of PD.<sup>4</sup> There was a male preponderance in idiopathic PD (m: f = 3.2:1) according to a study by Femi et al. In a study on Indian population by Behari et al the risk factors included that of male gender who had higher incidence (1:3.96) similar to that reported in other countries. However, this data may be confounded by the fact that in India, women compared to men, are less likely to seek or have access to medical attention.<sup>7</sup>

The frequency of young onset PD (<40 years) in our study was 4.44%. Femi et al also found 12.5% of the patients with PD presented before the age of 40 years.<sup>6</sup> In our study among 45 patients, maximum numbers of patients were from rural background. Environmental risk factors such as rural living, well water drinking, farming, and pesticide exposure have been described in the

development of PD. In the present study, 68.88% had tremor as the initial symptom, followed by rigidity (20%) and bradykinesia (11.11%).

In concordance with our study, Liu et al in Shanghai, China, found that tremor was the most common initial symptom (112 of 180 patients, 62.22%), followed by rigidity (38/180, 21.11%) and bradykinesia (28/180, 15.56%).<sup>7</sup> The majority of patients exhibited their first noticeable symptom in a unilateral limb and this proportion was highest in tremor-first patients. In our study, the initial symptom usually afflicted only a single limb (68.88%) and was most frequently tremor (74.19%). Liu et al also reported unilateral limb involvement in 73.63% patients and among these patients tremor was most frequently reported (70.99%).<sup>8</sup>

In this study, 22 patients gave a history of postural instability (48.89%), out of which 13 patients (28.89%) gave a history of fall. The frequency of falls has also been reported to have a direct correlation with age, disease

severity, medication, cognitive dysfunction, orthostatic hypotension, and visual impairment. Our study could not demonstrate age as an independent risk factor for falls. A previous study of falls both in PD patients and healthy adults had shown an association between adults >65 years and increased falls of 30 to 40%.<sup>8</sup> The speech changes were observed in 37.8% of the patients of our study.

Lazarus et al subjected PD patients to the Indian Speech and Hearing Association (ISHA) articulation assessment and the Vaghmi software. It was found that 64.7% had slow reading speed, 60.2% hoarseness of voice, 39.8% articulatory defect, and 32.3% jerky speech.<sup>9</sup>

In our study we observed that 15/45 (33.3%) patients experience forgetfulness, 3/45 (6.66%) experience hallucinations, 16/45 (35.55%) had gastrointestinal problems in the form of constipation, 14/45 (31.11%) had urinary problems in the form of incontinence and recurrent urinary tract infections and it was more common with males (9/14, 64.28%).

In a cohort study, done in Morocco the gastrointestinal symptoms were present in 80% of the patients. Constipation was the most common symptom in our patients and swallowing difficulties were around 20%.<sup>10</sup> Another study found that nocturia is the most commonly reported symptom (57-86%) followed by increased frequency (32-71%), urgency (32-68%), and urge incontinence (21-40%).<sup>11</sup>

### Limitations

Limitations of the study were less frequent family history; lower frequency of young onset PD contrasts the situation in western populations however the sample size is small in this study and it was a hospital-based study and not population-based study. Large population-based study is required to confirm our findings.

### CONCLUSION

Clinical profile of patients with PD in Himachal Pradesh was similar to that from other populations in India and other developing countries. All this information may prove valuable in diagnosing PD and for better treatment options tailored to the needs of our patients.

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*Ethical approval: The study was approved by the Institutional Ethics Committee*

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