

A CLINICAL PROFILE OF NON-MOTOR SYMPTOMS IN PARKINSON'S DISEASE- HOSPITAL BASED OBSERVATIONAL STUDY

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ABSTRACT

BACKGROUND

Parkinson's disease (PD) is the second most common neurodegenerative disorder. It is a result of degeneration of the substantia nigra, pars compacta with dysfunction of dopaminergic nigrostriatal pathway. The three cardinal signs of Parkinson disease are resting tremor, rigidity, and bradykinesia. Apart from these, non-motor symptoms (NMS)s substantially contribute to patient's quality of life and are a frequent cause of hospitalization which are poorly recognized and inadequately treated.

The objectives of the study are- 1) To find out the prevalence of non-motor symptoms in participants and 2) To classify and analyse the non-motor symptoms in them on the basis of system involvement.

MATERIALS AND METHODS

This is a hospital based observational study conducted on 50 patients of Parkinsonism over a period of 1 year. Parkinson's disease was confirmed by UKPDS Brain Bank Criteria. Neurological examination was conducted for MMSE scores and H and Y staging. Findings were recorded in predesigned and pretested questionnaire.

RESULTS

Out of 50 participants, 32% (16) belong to the age group of 61-70 years, and 56% were males. 60% were newly diagnosed during the study period. 50% had duration of illness of <1 year followed by 1-3 years (32%). Decreased libido was most common symptom (70%). Unsatisfactory voiding of the bowel was the most common in gastro intestinal symptom accounting for 70%. Dementia, anhedonia, and attention deficits were (62%) common neuropsychiatric symptoms. Insomnia was most prevalent symptom (82%).

CONCLUSION

The non-motor symptoms were universally prevalent in all the patients with Parkinson's disease. The number of non-motor symptoms increased as the stage of the Parkinson's disease progressed. Early recognition and treatment of non-motor symptoms is required to improve the quality of life.

KEYWORDS

Parkinsonism Disease, Non-Motor Symptoms.

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BACKGROUND

Parkinsonism Disease is a result of degeneration of substantia nigra, pars compacta and the consequent dysfunction of the dopaminergic nigrostriatal pathway. Serotonergic and noradrenergic pathways are also affected. The pathologic hallmark is a deterioration of the substantia nigra of yet unknown causes, resulting in a deficiency of dopamine, an important neurotransmitter for the basal ganglia circuit. A combination of genetic and environmental factors is likely to be important in producing abnormal

protein aggregation within select groups of neurones, leading to cell dysfunction and then death.¹

Parkinson's disease (PD) is the second most common neurodegenerative disorder, after Alzheimer's disease.² It is a common neurodegenerative disorder a synucleinopathy with a prevalence of 160/100,000 in Western Europe rising to 4% of the population over 80.³ Many affected patients are older than 55 years of age, and men seem to be slightly more predominantly affected than women.⁴

A study reported that about 1% of population above the age of 65 years and about 5% above the age of 80 years suffer from PD.⁵ In India approximately 700 million people will be above the age of 65 years, of which about 7 million will suffer from PD by the end of the century.⁴

The three cardinal signs of Parkinson disease are resting tremor, rigidity, and bradykinesia.⁸ The non-motor symptoms (NMS) of Parkinson's disease includes cognitive problems, apathy, depression, anxiety, hallucinations, and psychosis as well as sleep disorders, fatigue, autonomic dysfunction, sensory problems, and pain.^{1,6}

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Clinical research over the last two decades has revealed that the non-motor symptoms of Parkinson's disease involve several body systems and are a major cause of disability in these patients.¹ Despite of these, they have been under recognized and undertreated.^{6,7}

In India, few studies have documented the non-motor symptoms of PD in Indian context. Hence the present study was undertaken to assess the prevalence of prevalence of NMS in PD patients and to classify and analyse the NM symptoms on the basis of system involvement.

Objectives

1. To find out the prevalence of Non-Motor Symptoms in Parkinson's disease patients.
2. To classify and analyse the Non-Motor Symptoms in Parkinson's disease on the basis of system involvement.

MATERIALS AND METHODS

Study Design

Hospital based observational study.

Study Period and Duration

One-year study was conducted during the period of January 2015 to December 2015.

Source of Data

Patients proved to have Parkinson disease by UKPDS criteria attending Department of medicine and neurology at KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum were studied.

Sample Size

A total of 50 patients with Parkinson's disease were selected for the study.

Sampling Procedure

Based on the average 80% of the past three years hospital statistics the sample size was calculated to be 50 patients.

Inclusion Criteria

- Patients proved to have Parkinson's disease by UKPDS Brain Bank Criteria.

Exclusion Criteria

- History of multiple strokes.
- Patients with diabetes mellitus more than five years.
- Patients with known thyroid disorders.

Method of Collection of Data

Before the enrolment, demographic data such as age, sex and education were recorded. Patients were asked for the history regarding other neurological illness, duration and medications. Further thorough clinical examination was conducted. The diagnosis of Parkinson's disease was confirmed by UKPDS Brain Bank Criteria. Neurological examination was conducted for MMSE scores and H and Y

staging. These findings were recorded on a predesigned and pretested proforma.

After the clinical evaluation, the patients were provided with NMS Questionnaire to assess of non-motor symptoms.

Informed Consent

All the patients fulfilling selection criteria were explained about the purpose of study and a written informed consent was obtained to participate in the study before enrolment.

Ethical Clearance

Ethical clearance was obtained from Ethical and Research Committee, Jawaharlal Nehru Medical College, Belgaum.

Statistical Analysis

The data obtained was coded and entered into Microsoft Excel Worksheet. The categorical data was expressed as rates, ratios and proportions and continuous variables were expressed as mean ± standard deviation.

RESULTS

The present was hospital based observational study, conducted in the Department of Medicine and neurology, KLE'S Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum during the period of January 2015 to December 2015. A total of 50 patients with Parkinson's disease proved to have Parkinson's disease by UKPDS criteria were included.

Variable		Number	Percentage
Age (Years)	41-50	15	30
	51-60	15	30
	61-70	16	32
	71-80	04	08
Gender	Male	28	56
	Female	22	44

Table 1. Age and Gender Wise Distribution of The Participants

Out of 50 participants, 32% (16) were belongs to the age group of 61-70 years, followed by 41-50 years (30%) and 51-60 years (51-60 years). 56% were males.

Variable		Number	Percentage
Status	Newly Diagnosed	30	60
	On Treatment	20	40
Duration of Illness (In Years)	< 1	25	50
	1-3	16	32
	4-6	08	16
	7-9	00	00
	>9	01	02

Table 2. Diagnosis and Duration Status of Parkinsonism in The Participants

Among the total participants, 60% were newly diagnosed during the study period. 50% had illness < 1 years followed by 1-3 years (32%).

H ad Y Staging	Number	Percentage
1.0	9	18
1.5	2	04
2.0	11	22
2.5	7	14
3.0	16	32
4.0	5	10

Table 3. Distribution of the Participants Based on H and Y Staging

On using H and Y staging, majority of the participants were belonging to stage 3.0 (32%), followed by 2.0 (22%) and 1.0 (18%). The mean staging score for the study subjects was 2.40±0.89.

Non-Motor Symptoms (NMS)		Number	Percentage
Autonomic Symptoms	Urinary Urgency	18	50
	Nocturia	28	56
	Hypo/Hyper Sexuality	29	58
	Decreased Libido	35	70
	Orthostatic Hypotension	31	62
	Seborrhoea	23	46
Gastro Intestinal Symptoms	Sialorrhoea	10	28
	Dysphagia	14	28
	Nausea	34	68
	Constipation	31	62
	Bowel Incontinence	10	20
	Unsatisfactory Bowel Voiding	35	70

Table 4. Autonomic and Gastro Intestinal Non-Motor Symptoms (NMS) in Parkinson’s Disease Participants

In the present study, among the autonomic symptoms decreased libido was most common symptom (70%) followed by orthostatic hypotension (62%). Urinary urgency was least common symptom (36%). Unsatisfactory voiding of the bowel was the most common gastro intestinal symptom accounting for 70% followed by nausea (68%), constipation (62%).

Non-Motor Symptoms (NMS)		Number	Percentage
Neuropsychiatric Symptoms	Dementia	31	62
	Anhedonia	31	62
	Hallucination	02	04
	Attention Deficit	31	62
	Apathy	30	60
	Anxiety and Panic Disorder	13	26
	Delusion	08	16
Sensory System	Hyposmia	32	64
	Unexplained Pain (Paraesthesia)	41	82
Sleep Disorder	Excess Day Time Sleep	12	24
	Insomnia	41	82
	Vivid Dreaming	16	32
	REM Sleep Behavioural Disorder	05	10
	Restless Leg and Behavioural Limb Moments	32	64
Other Symptoms	Weight Gain	09	18
	Falls	13	26
	Swelling of Leg	20	40
	Diplopia	01	02

Table 5. Neuropsychiatric, Sensory System, Sleep Disorder and Other Symptoms in The Participants

Among the total participants, dementia, anhedonia, and attention deficits were common symptoms (62%) neuropsychiatric symptoms. Olfactory disturbances and unexplained pains were present in 64% and 82% patients

respectively. Insomnia was most prevalent symptom (82%) among sleep disorders, followed by restless legs and periodic limb movements which were observed in 64% of

participants. Weight changes (18%) and swelling of the legs (40%) were observed. 26% had symptoms of fall.

DISCUSSION

The present study was undertaken to study the non-motor symptoms in patients with Parkinsonism Disease (PD), with the primary objective to know the prevalence of non-motor symptoms in patients with PD and to classify and analyse the NMS on basis of systems involved.

This study was conducted in the Department of Medicine and neurology, KLE'S Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum on patients with PD. A total of 50 patients diagnosed with Parkinson's disease were selected for the study.

The diagnosis of Parkinson's disease was confirmed by UKPDS Brain Bank Criteria. Neurological examination was conducted for MMSE scores and H and Y staging. The patients were provided with NMS Questionnaire to assess of non-motor symptoms and the results were analysed.

In our study of the 50 patients studied, 56% (n=28) were males and 44% (n=22) were females with male to female ratio of 1.27. Several studies done in the past have also showed higher prevalence of PD in the males compared to the females. One meta-analysis⁸ based on 17 incidence studies of PD reported a pooled age-adjusted male to female ratio of 1.46.

In our study it was observed that highest number of patients (32%) belonged to the age group of 61-70 years. The next highest number of patients belonged to the age group of 40-50 years (30%) and 51-60 years (30%). Only 8% of the patients were aged above 70 years. The mean age of the study population was 57.92 ± 9.03 with median age of 58.5 years. These results were in line with other incidence studies, prevalence of PD clearly increases with age. However, some studies^{9,10} reported a decline in prevalence in the oldest age group (above 80 or more) perhaps due to under diagnosis of PD because of comorbidity,¹¹ non-response,¹² and unstable estimates due to small numbers in old age groups.

In our study of the total 50 patients, 60% (n=30) were newly diagnosed patients of Parkinson's disease with varying duration of illness but not on treatment. The remaining 40% (n=20) were known patients of Parkinson's disease of varying duration of illness on treatment particularly on levodopa therapy.

Analysing the NMS according to the systems involved, all the five autonomic symptoms studied were present in study group in various proportions. Decreased libido was most the autonomic common symptom that is, 70% (n=35). Urinary urgency was the least common symptom that is, 36% (n=18). Nocturia, hypo and hyper sexuality, orthostatic hypotension and seborrhea were present in 56% (n=28), 58% (n=29), 62% (n=31) and 46% (n=23) patients respectively.

Yu and colleagues¹³ noted that 17 of 21 (80%) male patients with PD had substantial impairment of sexual arousal, behaviour, drive, and orgasm domains, whereas in those with longer duration of the disease sexual fantasy was

increased. Another study reported high prevalence (76.5%) of sexual dysfunction in patients after bilateral subthalamic nucleus stimulation.¹⁴ In the study by Kelly Lyons and Lyons K et al¹⁵ in 2011 urinary disturbances were present in 60% of the study group.

In a study by Senard JM et al¹⁶ showed the presence of orthostatic hypotension in 58% patients which was similar to results of our study.

Gastro intestinal symptoms studied in the 50 patients, unsatisfactory voiding of the bowel was the most common gastro intestinal symptom accounting for 70% (n=35). Symptoms of dysphagia were present in 28% (n=14) patients of our study.

In study by Lyons K et al¹⁵ in 2011, constipation was experienced by 60% of the study group. Jost WH¹⁷ reported constipation and feeling of incomplete evacuation of bowel in 80% of patients with PD. In another study by Korczyn AD¹⁸ showed, constipation in about 50% of patients.

In the present study, among the neuropsychiatric symptoms, dementia, anhedonia, and attention deficits were the common symptoms with 62% (n=31) each. Symptoms of delusion and hallucinations were present in 16% (n=8) and 4% (n=2) patients respectively.

In a study by Emre M¹⁹ Dementia occurs in up to 40% of people with PD. Richard IH et al²⁰ reported clinically significant anxiety syndromes occur in up to 40% of patients with PD. Other study demonstrated prevalence of panic attacks in up to 25% patients. A study by Goetz CG et al.²¹ reported hallucinations and delusions occur in up to 40% of PD patients and are a major precipitant of nursing home placement.

In this study, insomnia was the most prevalent symptom that is 82% (n=41) among sleep disorders, followed by the symptom of restless legs and periodic limb movement which was observed in 64% (n=32) of patients. In the study by Chaudhuri KR et al,²² daytime sleepiness, insomnia, vivid dreams and restless legs were reported in 31%, 33%, 45% and 41% patients respectively.

Among the other symptoms in our study, weight changes and swelling of the legs were present in 18% (n=9) and 40% (n=20) of patients respectively. 26% (n=13) had symptoms of fall. Diplopia was least common symptom is the study and was present in only 1 patient.

Our results were comparable to the results published by Chuadhuri KR et al²² published in 2007 in which weight changes, swelling and falls were present in 18.29%, 31.30% and 28% of the study subjects. However, diplopia was present in 20% of patients in above study.

CONCLUSION

In conclusion, prevalence of PD was more in the males compared to the females. The mean age of the study population was 57.92 ± 9.03 years and the mean duration of illness in our study was 2 years. The non-motor symptoms were universally prevalent in all the patients with Parkinson's disease. The number of non-motor symptoms increased as the stage of the Parkinson's disease progressed.

Insomnia and unexplained pains were the most prevalent non-motor symptoms. Early recognition and treatment of non-motor symptoms may go a long way in improving the quality of life of PD patients as well as the economic burden on the careers.

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