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Clinical Presentation of Parkinson's Disease: Experience of using Movement Disorder Society Clinical Diagnostic Criteria for Parkinson's Disease

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Authors' contributions

This work was carried out in collaboration among all authors. Author MRH formed the idea of this study, collected data, performed analysis, and prepared the manuscript. Authors MAH and MAH provided support and guidance in all activities. Authors MRH and AMK reviewed and revised the manuscript. All the authors read and approved the final manuscript.

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ABSTRACT

Aims: Parkinson's disease (PD) is a common neurodegenerative disorder. As no definite diagnostic tests are available, diagnosis is done mostly clinically. UK Brain Bank criteria is commonly used globally for that purpose. In this study we used Movement Disorder Society (MDS) Clinical Diagnostic Criteria to diagnose PD and document the clinical presentations.
Study design: Descriptive cross-sectional study.
Methodology: This study was carried out in the department of neurology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, from May 2018 to April 2019. Total 42 patients (4 clinically established and 38 clinically probable PD) were enrolled as study population according to Movement Disorder Society (MDS) Clinical Diagnostic Criteria - 2015 for PD. Their patterns of clinical presentation were recorded.
Results: Among the PD patients, 31 were male and 11 were female. Mean age of all patients was

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59.43 ± 11.34 years. The most common presenting feature was tremulous movement (90.5%) followed by slowness of movement (40.5%). Only 9% patients had early onset PD. All patients had history of positive response to dopaminergic therapy with documented resting tremor in 95.2%, and end-of-dose wearing off in 75.6%. Constipation was the commonest (69%) non motor symptom followed by sleep dysfunction (64.3%) & depression (50%). On examination- 100% patients had bradykinesia, 97.6% rest tremor, 95.2% rigidity, 21.4% mild dementia and 4.8% moderate dementia. Also 26.2% patients were found to have postural hypotension. 4 patients had red flag features- urinary retention was found in three patients and one patient suffered from recurrent early fall.

Conclusion: MDS Clinical Diagnostic Criteria help in accurate diagnosis of PD and include more clinical features which will help in formulating management plan.

Keywords: Parkinson's disease; MDS clinical diagnostic criteria; clinical presentation; diagnosis.

1. INTRODUCTION

Parkinson's disease (PD) is a progressive degenerative disease of brain, characterized by resting tremor, rigidity, bradykinesia & postural instability, due to loss of function of the basal ganglia which is involved in the coordination of body movement. Annual incidence rates of PD in high-income countries are 14 per 100 000 people in the total population, and 160 per 100 000 people aged 65 years or older [1]. In 2016, 6·1 million individuals worldwide had Parkinson's disease, of whom 2·9 million (47·5%) were women and 3·2 million (52·5%) were men. There were approximately 54198 (42488 to 67532) cases of PD in Bangladesh in 2016 [2].

Typically the onset and progression of PD are gradual. The most common presentation is with rest tremor in one hand, often associated with decreased arm swing and shoulder pain [3]. Other presentations are tremor, gait disturbance, stiffness, slowness, muscle aches, loss of dexterity, handwriting disturbance, depression, nervousness, other psychiatric disturbance and speech disturbance [4]. But the recent studies included more motor and non-motor symptoms with increasing frequencies.

Till now the UK Brain Bank criteria [5] are the most commonly used criteria for PD worldwide. But with increasing knowledge of signs-symptoms of PD, necessity of developing a new criteria was felt to cover all important aspects of PD. To help to standardize clinical diagnosis, both for research (e.g., clinical trials) and for clinical practice in 2015, "Clinical Diagnostic Criteria for Parkinson's disease" (MDS-PD-CDC) was published by a task force from the International Parkinson and Movement Disorder Society (MDS) [6]. The important non-motor symptoms which were not included in the UK Brain Bank criteria have been included in MDS-PD-CDC. Also, to exclude other important causes of parkinsonism, absolute exclusion criteria & red flags were more clearly defined in new criteria. In this study, we used MDS-PD-CDC for diagnosing PD and documenting clinical presentation (elaborate motor & non-motor sign-symptoms which were relevant to the criteria) in the course of diagnosis.

2. METHODOLOGY

42 patients having features of PD, diagnosed by MDS Clinical Diagnostic Criteria for PD were taken as study population. Patients were selected purposively from outpatient and inpatient department of neurology of BSMMU. At first parkinsonism was defined (bradykinesia in combination with either rigidity, rest tremor, or both). Then the criteria were used to define whether this parkinsonism was attributable to PD or not. Patients having parkinsonism other than PD were excluded. Brain imaging was done in selected cases to exclude other differentials.

A structured questionnaire was developed using the selected variables according to the specific objectives. A check list section was also developed for data collection. Necessary modification was done before finalizing the questionnaire. The researcher collected data through face-to-face interview with the patient or his/her attendant. The medical records, demographics, clinical records of all the patients were examined. All the data were checked and edited after collection. The aims and objectives of the study were explained to the patients and/or attendants in easily understandable local language. They were also informed about the freedom to participate or not to participate at any time. No incentive was given for participation. It was assured that all informations and records were kept confidential.

3. RESULTS AND DISCUSSION

Mean age of all patients was 59.43 ± 11.34 years. Majority of patients belonged to age group 61 – 70 years (40.5%), followed in decreasing order by 51 – 60 years (28.6%), 41 – 50 years (16.7%), 31- 40 years (7.1%) and > 70 years (7.1%). Majority of patients were male (73.8%) with 2.6:1 male-female ratio.

The most common presenting feature was tremulous movement (90.5%) followed by slowness of movement (40.5%) (Fig. 1). All patients had history of positive response to dopaminergic therapy, 95.2% had documented resting tremor, and 75.6% had end-of-dose wearing off (Table 1). Mean age of onset of PD was 55.4±11.2 years ranging from 31 to 78 years. 91% patient's disease started after the age of 40 years. Most of the patients were suffering from PD for 1- 3 years (38.1%), 21.4% for 4-5 years, another 21.4% for 6-10 years (Table 2). On examination of PD patients: 100% had bradykinesia, 97.6% rest tremor, 95.2% rigidity, 26.2 % postural hypotension and 26.2% dementia (Table 3).

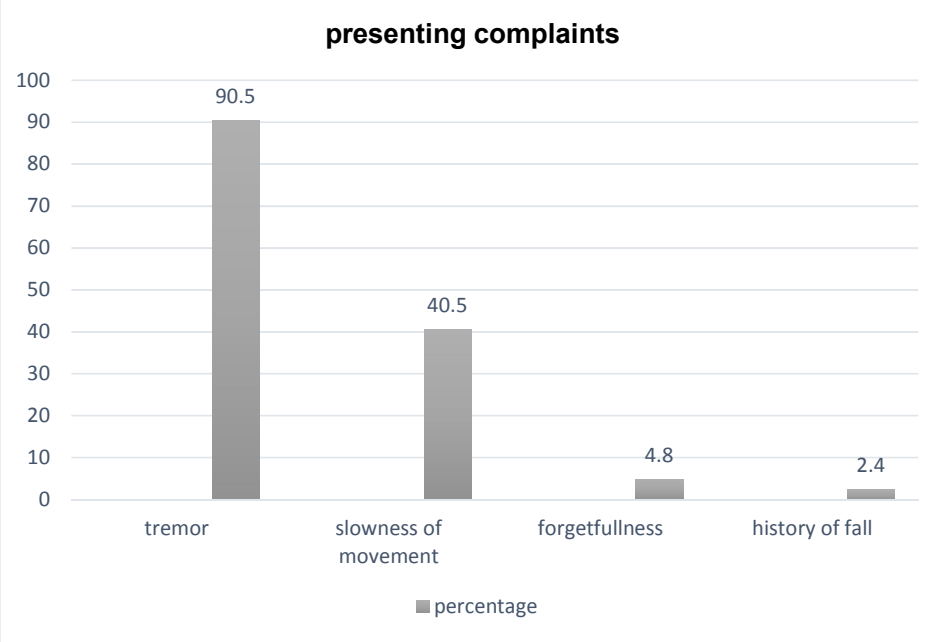

Fig. 1. Bar diagram showing the presenting complaints of Parkinson's disease patients

Table 1. Important history related to Parkinson's disease among patients

Past history of	Frequency	Percentage (%)
Positive response to dopaminergic therapy	42	100
Documented rest tremor	40	95.2
End-of-dose wearing off	31	75.6
Constipation	29	69
Sleep dysfunction	27	64.3
Depression	21	50
On-off fluctuations	11	26.2
Anxiety	7	7.8
Hyposmia	4	9.5
Urinary retention	3	7.1
Daytime urinary urgency	3	7.1
Recurrent early fall	1	2.4
Hallucination	1	2.4

Table 2. Duration of disease of Parkinson's disease patients

Duration of disease (years)	Frequency	Percentage (%)
<1	7	16.7
1-3	16	38.1
4-5	9	21.4
6-10	9	21.4
>10	1	2.4

Table 3. Clinical features (signs) of Parkinson's disease patients

Signs		Frequency	Percentage (%)
General			
Expressionless face		31	73.8
Postural Hypotension		11	26.2
Nervous System			
Higher psychic function			
Mood	Depressed	20	47.6
MMSE score	Normal (25-30)	31	73.8
	Mild Dementia (21-24)	9	21.4
	Moderate Dementia (10-20)	2	4.8
	Severe Dementia (<10)	0	0
Motor system		42	100
Bradykinesia Rigidity		40	95.2
Involuntary movement	Rest tremor	41	97.6
	Dyskinesia	1	2.4
Gait	Parkinsonian	19	45.2
Reflexes	Glabellar tap	28	66.7
	Palmo-mental	4	9.5
	Snout	6	14.3

Table 4. Brief comparisons between UK Brain Bank criteria and MDS Clinical Diagnostic Criteria

Traits	UK Brain Bank criteria	MDS Clinical Diagnostic Criteria
Diagnosis of parkinsonism	Bradykinesia plus at least one other sign among muscular rigidity, (4–6 Hz) rest tremor, and postural instability are required	Bradykinesia plus at least one between rest tremor (4–6 Hz) and rigidity (no postural instability) are required
Early autonomic failure	Exclusion criteria	One of the red flags, but no more an exclusion criterion
Early severe dementia	Exclusion criteria	Not included in exclusion criteria and red flags
Unilateral onset and persistent asymmetry	Important supportive criteria	Not included
Levodopa-induced dyskinesia	Not included	Included in supportive criteria
Common non-motor features	Not considered	Absence of common non-motor features included as a red flag
Ancillary diagnostic tests	No role	Included and have a supportive diagnostic role
Differentiation from atypical parkinsonism	Few points were considered	More points like cortical sensory loss, early bulbar dysfunctions, respiratory dysfunctions, disproportionate anterocolis, etc. are included

In this study, analysis of age distribution showed that the mean (±SD) age of cases was (59.43 ± 11.34) years which was consistent with a previous study done in Bangladesh where mean (±SD) age of male and female were 57.51 ± 7.1 years and 60.00 ± 10.2 years respectively [7]. Among the study population, the male- female ratio was 2.8:1. This finding coincides with a previous Bangladeshi study where male-female ratio was 2.6:1 [7]. Although PD has slight male preponderance [1], in our study the difference was more prominent. In context of our country female patients might get less preference for seeking medical attention. Probably that's why female patients were less enrolled in this study.

Only 9% patients had early onset of disease (<40 years) & 91% patient's disease began after the age of 40. Mean age of onset of PD was 55.40 ± 11.2 years ranging from 31 to 78 years. These findings are similar to some previous study [1]. Most of the patients were suffering from PD for 1-3 years (38.1%), 21.4% for 4-5 years, 21.4% for 6-10 years, 16.7% for <1 year and only 2.4% had PD for >10 years. The most common presenting feature was tremulous movement (90.5%) followed by slowness of movement (40.5%). Rest tremor was described as a presenting feature in almost 100% patients during their lifetime which was consistent with our findings [8]. But most of our patients were more conscious regarding tremor than slowness of movement which was contrary to some other study in which slowness of movement was the most troublesome symptom [9].

Regarding motor signs-symptoms, 95.2% had history of documented rest tremor, 100% had positive response to dopaminergic therapy, 75.6% had end-of-dose wearing off & 26.2% had on-off fluctuations which were quite similar to findings of a prior study [9]. Constipation was the commonest (69%) non motor symptom followed by sleep dysfunction (64.3%) & depression (50%). These findings coincided with a prior study [10] where constipation was the commonest (70-80%) non motor symptom followed by sleep dysfunction (70%). Similar findings were also found in a tertiary care hospital of Bangladesh where depression was found among 42% PD patients [11].

Surprisingly only 9.5% patients complained of hyposmia, which was much less in comparison to other studies [8], may be due to lack of definite objective olfactory function assessment test. In that study almost 80% patients had hyposmia or anosmia. Also, we found anxiety in 7.8% & hallucination in only 2.4% which were much less than other study showing anxiety & hallucination in 49% & 44% patients respectively [8]. More careful psychiatric history with involvement of psychiatrists may be needed for diagnosing mental health problems in PD patients.

Regarding autonomic features, 26.2% patients had postural hypotension which coincides with prolonged disease duration as 23.8% patients had more than 5 years disease duration. However, it was slightly less than other study where 40% patients had postural hypotension [10]. Also, urinary disturbances were found only in 14% patients which is much less than the findings (60%) of some other study [10].

21.4% patients had mild dementia and 4.8% had moderate dementia which coincides with prolonged disease duration as 23.8% patients had disease for more than 5 years. But it was less than another study which revealed about 50% dementia among the patients having disease duration more than 5 years [10]. 66.7 % patients had glabellar tap which was quite similar to 80.5% in a prior study [8]. Four patients had red flag features- urinary retention was found in three patients and one patient suffered from recurrent early fall. These four patients were diagnosed as clinically probable PD, the rest were clinically established PD.

Staging of PD and some other sign- symptoms like akathisia, postural instability, freezing, sensory symptoms were not documented as these features were not included in MDS-PD-CDC.

We tried to summarize the key differences between the UK Brain Bank criteria and MDS Clinical Diagnostic Criteria – 2015 (Table 4). For years, in our clinical practice, we used UK Brain Bank criteria, which was simple and less time-consuming. Though we found new criteria more complex, it was more useful regarding clinical management. Some important clinical features like common non-motor symptoms are now included. These non-motor symptoms warrant special attention, as these are easily overlooked, but cause significant morbidity. Also, differentiation from other atypical parkinsonism conditions can be done more precisely with the new criteria.

4. CONCLUSION

Though it's more time consuming than 1988 UK Brain Bank criteria, which is a challenge in a

busy outpatient department of our country, we have found MDS Clinical Diagnostic Criteria - 2015 for PD as an effective tool for diagnosing PD. Also the criteria helped us to easily document almost all important clinical presentation and to formulate our targeted management plan. However, our study population was small and it was a single center based study. A large multi-centered study should be done to conclude regarding utility of MDS-PD-CDC in our perspective and to have a clearer picture of clinical presentation of PD in our country.

CONSENT

Informed written consent was taken from each patient or from his/her attendant.

ETHICAL APPROVAL

Ethical approval was obtained from Institutional Review Board of BSMMU.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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