

Motoric Clinical Symptoms in Late Onset Parkinson's Disease at Dr. Hasan Sadikin General Hospital Bandung

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Abstract

Background: Parkinson's disease (PD) is a progressive neurological disorder characterized by a number of motoric symptoms which are resting tremor, bradykinesia, rigidity and postural disturbance. The main aim in carrying out this study was to observe the motoric clinical pattern in patients with late onset Parkinson's disease based on age, gender, and staging of the disease.

Methods: This was a descriptive retrospective study to 89 medical record of patients with late onset Parkinson's disease from Neurology outpatient clinic of Dr. Hasan Sadikin General Hospital Bandung in the period January 2010 to January 2013. Total sampling was used to determine the population sample size. The motoric clinical symptoms in patients with late onset Parkinson's disease were classified based on age at diagnosis, gender, and staging of the disease conducted using descriptive retrospective method. Besides, staging was made based on Hoehn and Yarl scale.

Results: Overall, 92% of the patients with late onset Parkinson's disease had resting tremor, and postural instability was less frequently found in 21% of patients. Sixty one men suffered from this disease, 43% were from the age group 60–69, and 32% were in stage III.

Conclusions: A majority of patients with the late onset Parkinson's disease show resting tremor that has the common motoric clinical pattern, followed by bradykinesia, rigidity, and some show postural instability. [AMJ.2017;4(1):11-5]

Keywords: Hoehn and Yarl scale, Hughes criteria, motoric clinical pattern, Parkinson's disease

Introduction

Parkinson's disease is a progressive neurological disorder characterized by a large number of motoric and non-motoric symptoms that can impact the function with variables degree caused by dopamine deficiency that are a consequences of the substantianigra degeneration.¹ The main motoric symptoms of Parkinson's disease consist of resting tremor, bradykinesia, rigidity and postural disturbance.¹

The disease is a slow progressive parkinsonian syndrome that begins insidiously and usually affects one side of the body before spreading to involve the other sides.² James Parkinson is the first person to describe Parkinson's disease and it was characterized

by "involuntary tremulous motion" with lessened muscular power.³

The etiology of Parkinson's disease still remains unknown but many studies have been supporting that the major risk factors could be from the combination of environmental and genetic factors.⁴ Factors that have been implicated include oxidative stress, inflammation, mitochondrial dysfunction, and signal alteration indicative of apoptosis.³ Recent studies have also consistently demonstrated that in some families, the disease is attributable to a mutation in a single gene. The genetic analyses have detected linkage to six chromosomal regions and have identified three causative genes: PARK1 (alpha-synuclein), PARK2 (parkin), and PARK7 (DJ-1).⁵ Besides environment and genetic factors, aging has also been one of the largest risk

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factors for the development and progression of Parkinson's disease, in which aging affects many cellular processes that predispose to neurons degeneration, and age-related changes in cellular function that predisposes to the pathogenesis of the disease. The accumulation of age-related somatic damage combined with a failure of compensatory mechanisms may lead to an acceleration of Parkinson's disease with age.⁶

In this study, the main aim was to describe the motoric clinical pattern in patients with late onset Parkinson's disease based on clinical diagnosis criteria. By conducting this study, benefits for general clinician in the diagnostic field will be able to be provided, which may help general clinician in identifying the disease earlier by recognizing the motoric clinical pattern manifest in patients with late onset Parkinson's disease. Moreover, by early identification of the motoric clinical pattern in patients with late onset Parkinson's disease, early treatment and management plan can be submitted for the benefits of the patients, especially for those patients with late onset.

Methods

Descriptive retrospective method was used to conduct this study by obtaining medical record of patients with late onset Parkinson's disease from Neurology outpatient clinic of Dr. Hasan Sadikin General Hospital Bandung from January 2010 to January 2013. Total sampling was used to determine the population sample size. All medical records obtained in this study were approved by the Health Research Ethics Committee. Motoric clinical pattern in patients with late onset Parkinson's disease was taken based on age at diagnosis, gender, and staging of disease.

The diagnosis of the patients on the medical record was taken based on Hughes diagnostic clinical criteria while the progression of the Parkinson's disease was taken based on The Hoehn and Yarl scale. Hughes criteria and The Hoehn and Yarl scale were described as follows: Step 1) Diagnosis of Parkinsonian Syndrome: Bradykinesia, at least one of the following (Muscular rigidity, 4-6 Hz rest tremor, postural instability was not caused by primary visual, vestibular, cerebellar, or proprioceptive dysfunction); Step 2) Exclusion criteria for Parkinson's disease: history of repeated strokes with stepwise progression of parkinsonian features, history of repeated head injury, history of definite encephalitis, oculogyric crises, neuroleptic treatment at

onset of symptoms, more than one affected relative, sustained remission, strictly unilateral features after 3 years, supranuclear gaze palsy, cerebellar signs, early severe autonomic involvement, early severe dementia with disturbances of memory, language, and praxis, Babinski sign, presence of cerebral tumor or communication hydrocephalus on imaging study, negative response to large doses of levodopa in absence of malabsorption, MPTP exposure; Step 3) supportive prospective positive criteria for Parkinson's disease. Three or more required for diagnosis of definite Parkinson's disease in combination with step one: unilateral onset, rest tremor present, progressive disorder, persistent asymmetry affecting side of onset most, excellent response (70-100%) to levodopa, severe levodopa-induced chorea, levodopa response for 5 years or more, clinical course of ten years or more.

The Hoehn and Yarl scale: 1) Only unilateral involvement, usually with minimal or no functional disability, 2) Bilateral or midline involvement without impairment of balance, 3) Bilateral disease: mild to moderate disability with impaired postural reflexes; physically independent, 4) Severely disabling disease; still able to walk or stand unassisted, 5) Confinement to bed or wheelchair unless aided.

Inclusion criteria of the study were all the Parkinson's disease outpatient medical records during study period diagnosed using Hughes clinical criteria. Exclusion criteria were medical records with uncompleted variable including data that supported Hughes clinical criteria and The Hoehn and Yarl scale. The collected data had been presented in the form of percentage and frequency using Microsoft Office Excel 2007.

Results

Total of 151 medical records were obtained within three years with 93 males and 58 females, but only 89 patients' medical records were included in this study. It was because 62 medical records did not fulfill the inclusion criteria of this study. As shown in Table 1, the common motoric pattern shown by patients with late onset Parkinson's disease was resting tremor with the least commonly occurring was postural disturbance.

As shown in Table 2, Parkinson's disease showed a higher frequency in male compared to female. Compared to the motoric clinical pattern based on gender, both male and female showed resting tremor that was the

Table 1 Distribution of Motoric Clinical Pattern according to Age

Age category (years)	Frequency	Resting Tremor (%)	Bradykinesia (%)	Rigidity (%)	Postural Disturbance (%)
60-69	39	38(97%)	17(43%)	14(35%)	6(15%)
70-79	37	34(91%)	24(64%)	24(64%)	8(21%)
>80	13	10(76%)	10(76%)	9(69%)	5(38%)
Total	89	82(92%)	51(57%)	47(52%)	19(21%)

Table 2 Distribution of Motoric Clinical Pattern according to Gender

Gender	Frequency	Resting tremor (%)	Bradykinesia (%)	Rigidity (%)	Postural Disturbance (%)
Male	55	51(92%)	31(56%)	31(56%)	15(27%)
Female	34	31(91%)	20(58%)	16(47%)	4(11%)
Total	89	82(92%)	51(57%)	47(52%)	19(21%)

main motoric symptoms commonly found, and less commonly was postural instability. For bradykinesia, female showed a higher frequency compared to rigidity, but in male, bradykinesia and rigidity were equally seen.

Table 3 shown that resting tremor was the common motoric symptom affecting patients at stage I and stage II of Parkinson's disease. Tremor decreases in frequency had the disease progresses while bradykinesia, rigidity, and postural disturbance increases in frequency had the disease progresses.

Discussions

Parkinson's disease has been a long perceived neurological disease related to aging, with two prominent hypotheses attributing a

substantive role to aging in Parkinson's disease pathogenesis, which are accelerated aging and normal aging-related neuronal degeneration affecting the substantia nigra in early or middle adult life.⁷ In this study, Parkinson's disease showed a higher prevalence at old age group 60-69 with lesser progression of the disease. This result has also been supported by the study conducted by Levy⁷ which discovered that advancing age is associated with a faster rate of motor progression, decreased levodopa responsiveness, more severe gait, and postural impairment.⁷

From this study, the incidence of Parkinson's disease is higher in male compared to female, similarly with other studies revealing that the prevalence of Parkinson's disease is higher in male than female due to the indolent of

Table 3 Distribution of Motoric Clinical Pattern according to the Staging based on Hoehn and Yarl Scale

Staging	Frequency	Resting tremor (%)	Bradykinesia (%)	Rigidity (%)	Postural Disturbance (%)
I	25	25(100%)	5(20%)	4(16%)	1(4%)
II	22	22(100%)	10(45%)	11(50%)	2(9%)
III	29	27(93%)	23(79%)	19(69%)	7(24%)
IV	12	8(66%)	12(100%)	12(100%)	8(66%)
V	1	0	1(100%)	1(100%)	1(100%)
Total	89	82(92%)	51(57%)	47(52%)	19(21%)

estrogen.^{8,9} That is why the progression of the disease is commonly more rapid in male than in female. It has been proved and revealed in many studies that estrogen provides neuro protective effects.⁸ The protective mechanism includes antioxidant agents and up regulation of Bcl-2, brain-derived neurotrophic factor, and glial cell-derived neurotrophic factor (GDNF), and it is also achieved through the alterations in dopamine D2 receptors and their associated G protein.⁸

The cardinal symptoms of Parkinson's disease are resting tremor, bradykinesia, rigidity, and postural disturbance.¹⁰ Resting tremor is a rhythmic oscillatory movement of a body part, resulting from the contraction of the opposing muscle groups.¹¹ In this study, it can be seen that the resting tremor equally affects both gender, female and male, and it is proven to be the most common motoric manifestation shown by both genders of patients with late onset Parkinson's disease.¹² It is often the first symptom of Parkinson's disease with more than 25 percent of elderly patients with Parkinson's disease that have an associated action of resting tremor.¹²

Bradykinesia which indicates slowness of movement is a hallmark of the basal ganglia disorder of the Parkinson's disease.¹³ As seen in the results in Table 2, bradykinesia showed a higher frequency as the disease progresses and it is seen more commonly in male than in female. Whereas, the frequency of rigidity varies in age group without any specificity and it is also seen more commonly in male than in female.

Staging in this study is based on Hoehn and Yarl scale to indicate the progression of the disease. Based on the staging of the disease, the motoric symptom commonly seen was resting tremor, and according to this study, resting tremor was seen at highest frequency in patients classified into stage I, stage II and stage III. The frequency of tremor decreases in patients with Parkinson's disease had the severity of the disease progresses. This study found, patients classified into stage IV or V almost showed no evidence of tremor.

Postural disturbance due to the loss of postural reflexes is generally a manifestation of the late stages of Parkinson's disease and usually occurs after the onset of other clinical features. Almost all patients classified into stage I showed no evidence of postural disturbance. Postural disturbance increased as the disease progressed where it commonly affected patients classified into stage IV or V. As in the results obtained in Table 2, it showed

that postural disturbance was commonly seen among male gender compared to female.

The limitation encountered while conducting this study was the medical records of the patients with late onset Parkinson's disease, where some of the patient's data were missing and some could not be included in this study due to incompleteness of the patient's data in the medical records which might decrease the accuracy of this study. Lastly, the use of larger samples size might help to increase the chance of significance as in reflecting the population mean accurately.

Parkinson's disease consists of a cascade of events that leads to cell death either through physiological aging process or pathological cause. The natural progression of Parkinson's disease is variable but it is usually more common in patients with late onset, and a thorough understanding of the broad spectrum of Parkinson's disease clinical manifestations is essential to the proper diagnosis of the disease, especially for motoric symptoms, early diagnosis has an important role for further Parkinson's disease management. It is an opportunity for general physician to make early diagnosis using motoric clinical pattern in late onset Parkinson's disease. In conclusion, the most common motoric clinical pattern in patients with late onset Parkinson's disease is resting tremor and the less common is postural disturbance. Parkinson's disease in elderly shows a higher prevalence affecting the male patients.

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