Original Article

Parkinson's Disease, Depression, and Quality-of-Life

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ABSTRACT

Background: Depression is the most common psychiatric disorder associated with Parkinson's disease (PD) but is often under diagnosed and under treated leading to worsening of symptoms and deterioration of the quality-of-life of the people suffering from this disease. **Aims:** The current study aims to determine the correlation between depression and health-related quality-of-life (HRQOL) domains in patients with PD. **Materials and Methods:** A sample of 65 consecutive patients attending the specialty Parkinson's clinic was assessed by a psychiatrist as part of the treatment protocol. Diagnosis of depression was done using the International Classification of Diseases-10 by a psychiatrist and depression was scored using the Geriatric Depression Scale (GDS). QOL-BREF Malayalam version was used to assess quality-of-life in the patients. **Statistical Analysis:** One-way ANOVA was used to find the difference in the quality-of-life experienced by different age categories, duration of the disease, psychiatric co-morbidity. Independent sample *t*-test was used to find the difference in the quality-of-life experienced by genders, co morbid conditions and to find the difference in the scores on GDS and domains of WHO QOL BREF. Association of H and Y staging and duration of Parkinsonism with GDS Scores were computed using Pearson's Chi-square test. **Results and Conclusions:** There was a significant association of female gender and depression with the physical and psychological domains of QOL while the duration and staging of PD did not have any association with QOL Domains. Depression thus emerges as one of the main predictors of poor quality-of-life in PD.

Key words: *Depression, Parkinson's disease, quality-of-life*

INTRODUCTION

Worldwide, studies indicate a wide range of occurrence of Parkinson's disease (PD), with prevalence rates ranging from 31 to 347/100,000.[1] Consensus of opinion at present is that depression is one of the most common neuro-psychiatric disturbances associated with PD.[2-4] The mean incidence of depression in PD is about 40%[5-8] with reported rates varying between 4% and 70% in different studies, according to different methodological and diagnostic criteria. Anxiety disorders are also common, with higher incidence than in other chronic medical conditions (38% vs. 11%).[9] A wide spectrum of psychiatric disorders in PD, ranging from pure depressive disorders, to pure anxiety, to comorbid depression and anxiety disorder have been described.[10] Some evidence suggests that depression is the prodromal symptom in a subgroup of persons with PD, characterized by a younger age at onset, decreased severity, and stronger family history of the disease.[11] It has been found that the symptoms of PD patients with depression were more severe than those of disabled control subjects with comparable neurological disorders.[12]

The etiology of depression is probably a multifactorial process including a reactive state to a chronic disabling disease and/or an underlying neuropathological process involving abnormalities of central monoaminergic neurotransmitter systems.[13]

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A study of 245 PD patients in which those with depression and those without depression were compared, argues for PD depression to be more likely to be due to neuropathological changes in the brain than to environmental and psychological factors.[2]

Depression is often not picked up in many patients as physicians tend to ignore anxiety and depression in older patients, concentrating instead on physical complaints. Many older patients are also reluctant to talk about their feelings or deny feeling sad or depressed. Clinicians must be sensitive to other signs, including worries about being a burden, feelings of worthlessness, losing interest in pleasurable activities, social withdrawal, and isolation (reluctance to be with friends, engage in activities, or leave home). Many of these symptoms, especially social withdrawal, may be dismissed as the natural consequences of reduced physical mobility and speech impairment associated with the disease. Another reason for missed diagnosis is that depression in PD is not straight-forward diagnosis because several clinical features of depression and PD overlap. As a result depression in PD is poorly recognized in clinical practice and depressive symptoms are frequently missed. Depressive symptoms make dealing with PD more difficult and create a vicious cycle that impairs quality-of-life. Health-related quality-of-life is the most important outcome of health care and a main predictor of mortality and morbidity.[6,7,14-16] It is a critical measure in health care as it incorporates the patients' own perspective of their health. Non motor symptoms have now been recognized as the major contributors to poor QOL; in particular neuro-psychiatric symptoms of which depression is the most common entity.

The current study aims to find out the correlation between depression and the health-related quality-of-life (HRQOL) in patients with PD.

MATERIALS AND METHODS

The study aims to determine the correlation between depression, gender, duration, and stage of the illness in patients of PD with the different domains of HR-QOL.

The study was done on a cohort of patients attending a specialty PD clinic in a tertiary referral hospital. The clinic is a multi-disciplinary facility, exclusively for movement disorders with a team comprising Neurologists, Psychiatrist, Physiatrist, Speech and Swallow therapist, and Dietician. A sample of 65 consecutive patients diagnosed to have Idiopathic PD attending the specialty Parkinson's Clinic were assessed by a psychiatrist as part of the treatment protocol. The sample comprised of 45 males and 20 females with a mean age of 60 years. Patients with mini mental status examination scoring of <27 were excluded from the study.[17] The demographic and other clinical data were collected from the patients clinical records. The diagnosis of depression was done using the International Classification of Diseases-10 (ICD-10) diagnostic criteria for depressive disorders.

Geriatric Depression Scale (GDS) was also used to rate the severity of depression. The GDS-15 is already established as a valid tool for screening for depression in PD.[18]

The patients were administered the WHO-QOL BREF-Malayalam version to determine the different domains of HR-QOL.[19]

The WHO QOL-BREF is designed to measure quality-of-life.[20-22] The scale has 26 questions in 4 domains, a general question about quality-of-life, and a general question about health. All questions have five options of response, with higher scores indicating better quality-of-life. In non-PD population, the WHO-QOL BREF showed good psychometric properties. The WHO QOL-BREF is suggested for use in PD by the Movement Disorder Society Task Force commissioned to rate the psychometric quality of available health-related quality-of-life scales as applied to PD.[23]

The assessment of the severity of PD was done using the Hoehn and Yahr-(HandY) staging of PD. Hoehn and Yahr Degree of Disability Scale is a standard clinical measure of PD progression. It globally measures signs and symptoms of functional impairment, including postural instability, rigidity, tremor, and bradykinesia. The stages 1-3 represent low to moderate incapacity, and stages 4-5 indicate serious incapacity.[24]

Statistical analysis

One-way ANOVA was used to find the difference in the quality-of-life experienced by different age categories, duration of the disease, psychiatric co-morbidity. Independent sample *t*-test was used to find the difference in the quality-of-life experienced by genders, co-morbid conditions and to find the difference in the scores on GDS and domains of WHO QOL BREF. Difference was computed on the scores of GDS and diagnosis of depression by psychiatrist to find the agreement between the two using McNemar Chi-square test. This was also done in part to determine the sensitivity of GDS in detecting depression in this population. Association of HandY staging and duration of Parkinsonism with GDS scores were computed using

Pearson's Chi-square test. Kruskal Wallis test was used for comparing the H andY staging and QOL domains while independent *t*-test was used for comparing duration and domains.

RESULTS

Descriptive statistics of the sample on their performance on WHO QOL BREF Scale and their performance on Geriatric Depression Rating Scale were computed, the results of which are tabulated in Table 1.

A significant difference was found between the genders and the social interactions domain of BREF (0.03).

Depression in PD was associated with significant differences in the physical and psychological quality-of-life domains [Table 2]. While the social and environmental domains of QOL were not found to be significantly affected.

Geriatric Depression Scale scores have shown to have a good correlation with the ICD-10 diagnosis of depression by the clinician, ($P = 0.00$) reiterating the fact that it is a sensitive instrument to detect depression [Table 3].

The duration and stage of the disease did not show significant association with depression or any of the domains of QOL.

Table 1: Mean and SD of the sample on WHO QOL BREF and GDS

QOL domains and depression score	Gender	*n*	Mean and (SD)
GDS	Male	45	2.18 (0.91)
	Female	20	2.30 (0.80)
Physical domain	Male	44	12.48 (2.48)
	Female	20	10.79 (2.96)
Psychological domain	Male	44	12.63 (3.14)
	Female	20	11.79 (3.22)
Social domain	Male	39	13.57 (3.57)
	Female	16	14.7 (3.92)
Environmental domain	Male	44	13.5 (3.12)
	Female	20	14.7 (2.32)

GDS – Geriatric depression scores; SD – Standard deviation; WHO – World health organization; QOL – Quality-of-life; GDS – Geriatric depression scale

DISCUSSION

With the improvements in the treatment of motor symptoms, nonmotor symptoms of PD have been increasingly recognized as a major cause of disability, particularly neuro-psychiatric disorders and cognitive impairment.[5]

In most studies, nonmotor symptoms, particularly depression and cognitive dysfunction, have been shown to contribute equally or more so to impairment in activities of daily living than limitations imposed by motor impairment. Depression is often associated with increased disability, a worse HRQOL, more rapid progression of motor impairment/disability, and an increased mortality.[25] A large patient survey has actually found a greater impact of psychiatric-related symptoms on HRQOL in earlier phases of the disease compared with later stages.[26] This indicates that psychiatric symptoms such as anxiety and depression are not merely a reaction to the stress of having a long standing disabling neurological syndrome but an integral part of the neuropathological process.

In the present study too, what emerges is that the most important predictor for poor QOL is not the severity of the motor symptoms or the duration of the illness but the presence of depression.

HR QOL is a reflection of the perceived disability from a patient's point of view and the most important indicator of the handicap experienced by the patient. Early evaluation and treatment of nonmotor symptoms in PD potentially could improve HRQOL and patient productivity, reduce morbidity, and minimize direct and indirect healthcare costs. This study, thus reiterates the importance of accurate diagnosis and treatment of depression in PD.

The methodological limitations of the study are common to many studies of a similar nature-the difficulty in making a diagnosis of depression due to an overlap in the symptoms cluster. One of the major problems concerns the core cognitive-somatic feature of depression (i.e., symptoms of difficulty in concentrating, loss of energy, psychomotor retardation, fatigue, and apathy), which may be present in PD patients with no depressive mood disorder diagnosis.[2,27-29]

Table 2: Difference in the QOL experienced by different age categories, duration of the disease, and depression diagnosed with ICD-10

Variables	Age	Duration	Diagnosis of depression by psychiatrist	Gender	Physical co-morbidity	GDS score
Physical domain	0.94	0.93	0.01**	0.03*	0.80	0.001*
Psychological domain	0.82	0.27	0.01**	0.23	0.94	0.01**
Social domain	0.98	0.18	0.38	0.27	0.11	0.52
Environmental domain	0.83	0.81	0.63	0.20	0.77	0.09

$^{**}P < 0.05$; $^{*}P < 0.01$. GDS – Geriatric depression scale; ICD – International classification of diseases; QOL – Quality-of-life

Table 3: Agreement between scores of GDS and diagnosis of depression by psychiatrist in percentage

Variables %	GDS		*P*
	No depression %	Depression %	
Diagnosis of depression by psychiatrist			
No depression			0.000**
Psychiatric co-morbidity	38.9	61.1	
GDS	82.4	47.8	
Depression			
Psychiatric co-morbidity	11.1	88.9	
GDS	17.6	52.2	

** $P < 0.01$. GDS – Geriatric depression scale

The descriptive and clinical characteristics of depression and anxiety in PD have also not been carefully investigated.[30]

In the present study, the diagnosis of depression using ICD-10 by the psychiatrist and the GDS scores has good correspondence indicating that GDS is very sensitive in picking up depression.

The complexity of the concept of quality-of-life is another limitation of this study, because many variables that potentially contribute to quality-of-life, such as social support, individual coping strategies, and cultural context, were not directly measured by the used tool-the WHO QOL-BREF.

In non-PD populations, the WHOQOL-BREF showed good psychometric properties,[21,22,31]

But in the PD population, it has been rarely used and has not been formally validated.[32,33] It has, however, been suggested for use by the movement disorders society task force.

Psychiatric conditions other than depression have not been taken into consideration in the present study. A larger sample taking other neuro-psychiatric problems and cognitive deficits could have yielded richer information.

CONCLUSIONS

Depression is a significant contributor to disability and low quality-of-life in PD.

HRQOL is not significantly associated with the duration and staging of the illness.

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Appendix

Hoehn and Yahr (H&Y)Staging of PD

Stage One
Signs and symptoms on one side only
Symptoms mild
Symptoms inconvenient but not disabling
Usually presents with tremor of one limb
Friends have noticed changes in posture, locomotion and facial expression

Stage Two
Symptoms are bilateral
Minimal disability
Posture and gait affected

Stage Three
Significant slowing of body movements
Early impairment of equilibrium on walking or standing
Generalized dysfunction that is moderately severe

Stage Four
Severe symptoms
Can still walk to a limited extent
Rigidity and bradykinesia
No longer able to live alone
Tremor may be less than earlier stages

Stage Five
Cachectic stage
Invalidism complete
Cannot stand or walk.

Requires constant nursing care