

**Burden of Depression in Patients of Parkinson's Disease Presenting to a Single Tertiary Care Institution**Shoaib Luqman<sup>1</sup>, Wajih-ur-Rehman<sup>1</sup>, Sara Baber Malik<sup>1</sup>, Muhammad Zishan<sup>2</sup>, Muhammad Wahab Qureshi<sup>2</sup>, Sohail Attaur-Rasool<sup>1</sup>**Abstract**

**Background:** Depression is a commonly reported co-morbid condition in Parkinson's Disease (PD). It is often ignored while treating somatic motor manifestations of the disease.

**Objective:** To determine the frequency of depression in patients with Parkinson's disease

**Methodology:** Study Design: Cross-sectional survey. Place & Duration of Study: Department of Neurology, Bahawal Victoria Hospital, Bahawalpur from December 2020 to May 2021. One hundred and fifty physician-diagnosed cases of PD were recruited. We diagnosed PD through the United Kingdom Parkinson Disease Society Brain Bank criteria (UKPDSBB). Depression was defined according to ICD-10 criteria. Numerical variables like age and duration of disease were presented as Mean±SD, whereas depression and sex were presented as percentages. The chi-square test was used to compare the sex-wise distribution of depression. SPSS version 20 was used for data analysis.

**Results:** In our study, 54 (36%) patients fulfilled the ICD-10 criteria to be labeled as suffering from Depression whereas 96 (64%) were not found to be depressed. Among the 54 patients meeting the ICD-10 criteria for depression, 24 (44.4%) were females and 30 (66.6%) were males. Of the 96 patients found not to be depressed, 36 (37.5%) were females (37.5%) and 60 were males (62.5%). (p=0.4)

**Conclusion:** Depression was found to be present in a significant number of patients with Parkinson's disease, with more frequency among females.

**Keywords:** Parkinson's Disease, Depression, Gender

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**Introduction**

Parkinsonism is most frequently manifested as Parkinson's disease (PD) with the presentation of resting tremors, slowness of movements, unstable posture, and rigidity.<sup>1</sup> The prevalence of PD in the general population is thought to be about 0.3%.<sup>2</sup> In people above 60 years of age, approximately 1% are having PD. Approximately six million people have PD Worldwide. Many epidemiological studies on PD have reported a male predominance.<sup>2</sup>

The most frequent psychiatric feature of PD is Depression. Depressive complaints of patients of PD are usually not of a severe category but they result in aggravation of motor disorder and quality of life (QoL) deteriorates.<sup>3</sup> It has been estimated that as many as 50% of patients with PD present with a chief complaint of depression. In community reports, <10% of PD patients reported major depression while in specialty clinics the rate of major depression has been up to 20%.<sup>4</sup>

It has always been a challenge to diagnose features of depression in PD. The slowing of body functions and weakened responses observed in

depression closely mimic the mask-like face and slowing of movements of PD.<sup>4</sup> There is a lack of local data about the frequency of depression in PD. In a study of 100 patients with PD, depression was found to be present in 31% of patients.<sup>5</sup> That study revealed that a significant number of patients of PD suffer from depression and emphasized the need for methodologically sound follow-up studies to ascertain the epidemiological features of depression in PD. Since the publication of the study mentioned above, many new interventions for the treatment of PD as well as depression have been introduced likely to influence the frequency of depression in PD. Moreover, variations have been observed in the reported frequency of depression in patients of PD between international and local studies; 10 to 20% in international studies versus 31% in local studies.<sup>4,5</sup>

The purpose of our study was to determine the frequency of depression in patients with Parkinson's disease so that early diagnosis and appreciation of depressive symptoms in these patients can prevent the negative effect on motor abilities and improve the QoL of patients of PD. A more reliable measure of the frequency of depression among patients of

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Parkinson's disease in our local population could be obtained.

## Methodology

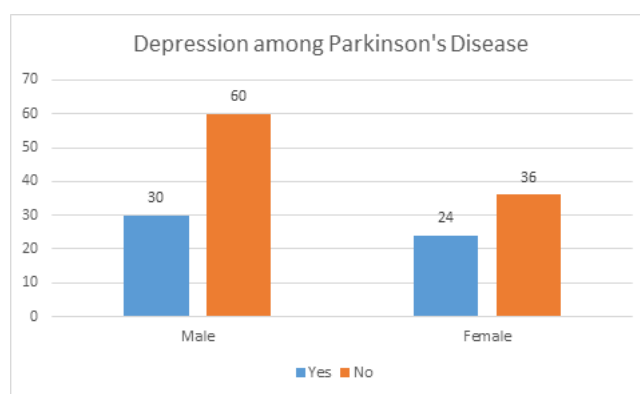
This cross-sectional study was conducted at the Department of Neurology, Bahawal Victoria Hospital, Bahawalpur from December 2020 to May 2021. We sought to ascertain the frequency of depression in patients with Parkinson's Disease. We recruited 150 patients with Parkinson's Disease presenting to the in-patient and out-patient sections of the Neurology department, Bahawal Victoria Hospital, Bahawalpur, and fulfilling the inclusion criteria. PD was diagnosed by a team of experienced specialist neurologists on the United Kingdom Parkinson Disease Society Brain Bank criteria (UKPDSBB) for diagnosis of Parkinson's disease.<sup>6</sup> Both male and female patients were included. The sample size was calculated by assuming the 95% confidence level, 8% margin of error, and taking an expected percentage of depression i.e. 31% among patients with PD.<sup>5</sup> We employed a non-probability purposive sampling technique for the recruitment of study participants. Depression was defined according to ICD-10 criteria.<sup>7</sup> A signed written informed consent was sought by the patients. A detailed examination of the patient including the history of illness, usage of drugs, and physical examination was carried out. Patients having any chronic illness such as malignancy, chronic renal failure, or diabetes which can give rise to depressive symptoms were excluded. Patients with a history of anti-depressant use before the onset of Parkinsonian symptoms and those with secondary causes of Parkinsonism such as drugs or multiple previous strokes were excluded. The socio-demographic information like age, sex, and duration of PD was collected on a specific patient proforma. The history of depression was obtained by asking about low mood, decreased interest or pleasure in tasks that are otherwise pleasurable, dwindling energy or increasing fatigue, no confidence, feelings of guilt, frequent thoughts of death or suicide, decreased capability of thinking or focusing, change in skill activity or change in desire for food, according to ICD-10 criteria. Effect modifiers like age and duration of PD were addressed through stratification. The collected data were entered into version 21.0 of SPSS and analyzed through it. Means and standard

deviations were calculated for quantitative variables namely age and duration of the Parkinson's disease. Frequencies and percentages of qualitative variables including gender and presence or absence of depression were calculated.

## Results

Out of 150 patients in our study, 90 (60%) were males and 60 (40%) were females. The ratio of male to female was 1:1.5. The Mean age of patients included in the study was  $54.5 \pm 8.7$  years, with a minimum age of 36 years and a maximum age of 80 years. In this study, 59 (39%) patients were found to be in the age group of 46 to 55 years.

**Figure I: Sex wise distribution of Depression among Parkinson's Disease**



Depression was found to be present in 54 (36%) patients. The mean age of depressed patients was  $55.6 \pm 9.85$  years. The mean age of non-depressed patients was  $53.8 \pm 8.1$  years. Among the 54 patients meeting the ICD-10 criteria for depression, 24 (44%) were females and 30 (56%) were males. Of the 96 patients found not to be depressed, 36 (37.5%) were females and 60 (62.5%) were males. ( $p$  value=0.4) (Figure I) The mean duration of Parkinson's Disease in the study group was  $44.5 \pm 27.1$  months. The most commonly observed duration of PD was 24 months (2 years) seen in 35 (23.3%) patients. The mean duration of PD in patients suffering from depression was  $52.4 \pm 31.9$ . The minimum duration of PD in patients suffering from depression was 12 months (1 year) and the maximum recorded duration of PD in depressed patients was 144 months (12 years). The mean duration of PD in non-depressed patients was  $40.1 \pm 23$  months.

## Discussion

Parkinson's Disease is a major cause of disability and morbidity across all nations and all socio-economic classes. Depression is a well-recognized feature of people suffering from Parkinson's disease. It negatively affects the motor capability and decreases QoL. Early recognition of depression among PD patients is challenging as the slowing of skilled activity and blunted responses routinely seen in depression are often mistaken for the slowing of movements and mask-like facial expressions of PD.<sup>8,9</sup>

In a previous study of 100 patients of PD conducted in Pakistan, depression was found to be present in 31% of patients. This study revealed that a significant number of patients with PD suffer from depression and emphasized the need for methodologically sound follow-up studies to ascertain the epidemiological features of depression in PD.<sup>5</sup> In our study conducted on 150 patients, depression was found to be present in 36% of patients, which represents a minor increase in the figures noted previously. Moreover, male to female ratio in our study was 1.5: 1, which also corresponds well with the slight male predominance of PD noted in many but not all international studies.<sup>1,7</sup> Among the PD patients suffering from depression, 56% were males and 46% were females in our study. A recent study conducted on newly diagnosed PD patients in Taiwan has reported a preponderance of females at 58%.<sup>10</sup>

There is a wide disparity in figures noted for depression in PD in international studies.<sup>9,10</sup> The stated frequencies vary between 2.7 to 70% and methodological differences account for this disparity.<sup>10</sup> However, a recent survey showed the frequency of depression in PD was estimated at 35%,<sup>11</sup> which compares well with our observed figure of 36%. It is also pertinent to highlight that the actual population-based prevalence of PD is claimed to be lower than those reported by studies conducted by tertiary-care institutions.<sup>12</sup>

We observed significant differences in the mean duration of PD in patients suffering from depression as compared to non-depressed patients (52.44 vs. 40.125 months). Many longitudinal studies argue that depression and its treatment affect the outcome of motor symptoms in PD.<sup>12,13</sup>

Thus it can be assumed that chances of developing depression increase proportionately with the increasing duration of PD. The onset of depression coincident with the use of L-dopa is the expected eventuality in 15 to 20% of patients.<sup>3</sup> Despite its clinical significance, depression is often overlooked in patients suffering from PD. Prompt treatment of depression can result in a better outcome for patients with Parkinson's disease. There is an ever-increasing need for the physicians responsible for the care of PD patients to evaluate patient's mood and QoL and be on the lookout for depression.

The limitation of this study was a collection of patients from a single tertiary-care hospital. Results from more settings are required to give a further idea of the occurrence of depression in patients with PD. Similarly, we were not able to evaluate the general PD population properly because the patients presenting at tertiary care settings are usually the refractory cases. Our study highlights the importance of screening for depression in patients with Parkinson's disease and their proper and early referral to the psychiatrists which will lead to better control of the disease and improvement in QoL.

## Conclusion

Depression is a significant co-morbid condition in Parkinson's Disease, with more frequency among females. Early recognition and treatment can improve the Quality of Life in patients resulting in decreased disability.

**Authors Contribution:** **SL:** Conception of work, Acquisition and Analysis of data and Drafting. **WR:** Acquisition and Analysis of data, Interpretation of data and revising. **SBM:** Design of work, Acquisition and Analysis of data and revising. **MZ:** Interpretation of data and revising. **MWQ:** Acquisition and Analysis of data and drafting. **SAR:** Design of work and drafting.

All authors critically revised and approve its final version.

**Conflict of Interest:** No conflict of interest among authors.

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