

# Depression and Dementia in Patients with Parkinson's Disease

## Research Article

Vashadze S<sup>1\*</sup>, Brunjadze S<sup>1</sup>, Kekenadze M<sup>2</sup>, Qatamadze Sh<sup>3</sup>, Kvirkvelia N<sup>4</sup> and Beridze M<sup>2</sup>

<sup>1</sup>Batumi Shota Rustaveli State University, Batumi, Georgia

<sup>2</sup>Tbilisi State Medical University, Tbilisi, Georgia

<sup>3</sup>Batumi Medcenter

<sup>4</sup>Tbilisi State University

\*Corresponding author: Vashadze S, Batumi Shota Rustaveli State University, Batumi, Georgia; E-mail: dake58@mail.ru

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### Abstract

**Introduction:** Dementia is characterized by a decline in thinking, emotional flatness, and reasoning that develops in many people living with Parkinson's and begins at least a year after diagnosis [1,2]. The aim of our study was to determine the rate of depression and cognitive impairment in patients with Parkinson's disease in Georgia. We studied patients diagnosed with Parkinson's disease 3-10 years before our study began.

**Methods:** The study was conducted at a Medical Center in Batumi, Georgia in between 2018-2021. Written informed consent was obtained from all subjects or their legal representatives before the study. None of the participants had another neurological, psychiatric, ophthalmological, or musculoskeletal co morbidity that interfered with the research. Handedness was assessed using the Edinburgh Handedness Inventory. The Beck depression scale (Beck depression inventory - BDI) was used to evaluate the severity of depression. Neuroimaging was performed in all patients - computer tomography or magnetic resonance imaging (CT or MRI). Neuroimaging studies were used to measure brain volume and extent of cortical atrophy in parkinsonian patients. For the diagnosis of dementia, Mini-Mental State Examination was used.

**Results:** In patients with Parkinson's disease, the middle age was 69.4 years. Moderate dementia was detected in 20 (20%) of patients - a significant deterioration in memory for current events were seen. severe dementia was detected in 25 (25%) of patients with Parkinson's disease. Depressive disorders were detected in 82 persons (42 women and 40 men). Among them, 20% fulfilled signs of a moderate degree of depression, 25% severe degree of depression, and 55% mild degree of depression. There was no correlation between the onset time of disease and the severity of depression. Our neuroimaging studies revealed cortical atrophy in 24 (24%) of the patients with the expansion of the ventricles. The atrophic process is strongly expressed in the temporal and frontal regions.

**Conclusion:** The incidence of cognitive impairment in patients with Parkinson's disease was quite high in Georgia. According to our study, patients with Parkinson's disease have a fairly high rate of both depression and the degree of dementia. Depression and dementia appear soon after the onset of the disease.

**Keywords:** Dementia; Depression; Mini-Mental State Examination; Parkinson's disease

## Introduction

Dementia is a decline in thinking, emotional flatness, and reasoning that develops in many people living with Parkinson's at least a year after diagnosis. The brain changes caused by Parkinson's disease begin in the part of the brain that plays a key role in movement, leading to early symptoms that include tremor and shakiness, stooped posture, muscle stiffness, a shuffling step, difficulty initiating movement, and amimia [1-3].

The organization of treatment of patients with Dementia and their care requires enormous financial resources. Dementia is a source of stress for relatives of patients and caregivers. An estimated 50 to 80 percent of those with Parkinson's eventually develop dementia- cognitive disorders as their disease progresses. Some studies have reported that the average time from onset of Parkinson's to developing dementia is about 10 years. Certain factors at the time of Parkinson's diagnosis may increase future dementia risk, including advanced age, greater severity of motor symptoms and **mild cognitive impairment (MCI)**, and frequent head trauma.

## Material & Methods

The aim of our study was to determine the rate of depression and cognitive impairment in patients with Parkinson's disease in Georgia. We studied patients diagnosed with Parkinson's disease between 3-10 years before our study began.

The study was conducted at a Medical Center in Batumi, Georgia for three years- from 2018-2021. Written informed consent was obtained from all subjects or their legal representatives before the study. None of the participants had another neurological, psychiatric, ophthalmological, or musculoskeletal co morbidity that interfered with the study. Handedness was assessed using the Edinburgh Handedness Inventory.

100 patients from the age of 50 to 80 years were enrolled. Among them are 60 men and 40 women. The Beck depression scale (Beck depression inventory – BDI) was used to evaluate the severity of depression. BDI is one of the most common questionnaires for detecting depression (sleep disturbances, mood changes, self-awareness, suicidal thoughts, etc.). 0-7 points representing- the absence of depression; 8-12 - mild depression; 13-17 - moderate depression; 18-29 - severe depression; 30 and more - very serious depressive disorder.

Neuroimaging was performed in all patients - computer tomography or magnetic resonance imaging (CT or MRI). Neuroimaging studies were used to measure brain volume and extent of cortical atrophy in parkinsonian patients. For the diagnosis of dementia, Mini-Mental State Examination was used. The final score was displayed by summing the results for each of the items. The maximum is 30 points, which corresponds to the optimal state of cognitive function. The lower the total score, the more the cognitive deficit. The results of the test can be interpreted as follows: 28-30 points - there are no violations of cognitive functions, 24-27 points - pre-cognitive impairment; 20-23 points - mild dementia; 11-19 points - moderate degree dementia; 0-10 points - severe dementia.

## Results

25 patients with a three-year history of Parkinson's disease, 40 patients with a history of more than three years (3-5 years), and 35 patients with a history of parkinsonism five to 10 years were examined. In patients with Parkinson's disease, the middle age was 69.4 years.

Moderate dementia was detected in 20 (20%) of patients - a significant deterioration in memory for current events were seen. The new information was only remembered for a short time. Simple everyday events seem to be a struggle. The motor speech was affected, personal characteristics as well, only retained the skills of elementary self-care, and patients poorly observed the rules of personal hygiene, however, the patient's independent existence was possible but difficult; patients needed a part-time caregiver. In Patients with moderate dementia as the disease progressed, the signs and symptoms become clearer and more restricting. These included: becoming forgetful of recent events and people's names, being lost in street, and having increasing difficulty with communication, needing help with personal care, experiencing behavior changes, including wandering and repeated questioning.

Severe dementia was detected in 25 (25%) of patients with Parkinson's disease. The deep amnesia with complete disorientation of time and place, as well as in one's own personality, patients was experiencing behavior changes that may escalate, including aggression.

Dementia severity was in line with disease progression; the longer the disease duration dementia severity progressed as well.

In patients with severe dementia, speech, and walking were disrupted. Daily activity, self-service skills affected. Memory disturbances were more apparent. Patients needed constant support and care; they did not comply with the minimum requirements for personal hygiene. Complete loss of skills of self-service was observed; there was no control over defecation and urination. They have experienced behavior changes that escalated frequently and included aggression. According to our study on patients with Parkinson's disease, the early stage of dementia is often overlooked, because the onset is gradual. Common symptoms include: forgetfulness, losing track of the time, and becoming lost in familiar places. Intellectual reduction manifests itself in difficulty solving problems in daily activities and in the sphere of professional activity (especially among intellectuals). We also screened patients for Depression, using Beck Depression Scale. Patients with depression showed many complaints regarding memory, attention, difficulty in performing intellectual tasks, and thoughts about suicide. Their self-esteem was reduced. According to our data, the patients with depression had decreased mood which was detected in 65% of the patients, a decrease in appetite in 85%, loss of body weight in 22%, and sleep disorders (insomnia or hypersomnia) in 96%, psychomotor agitation or inhibition in 81%, fatigue in 45 %, the presence of suicidal thoughts in 33%. Depressive disorders were detected in 82 persons (42 women and 40 men). Among them, 20% fulfilled signs of a moderate degree of depression, 25% severe degree of depression, and 55% mild degree of depression. There was no correlation between the onset time of disease and the severity of depression.

The main signs of depression in patients with Parkinson's disease with dementia were: aggressiveness, agitation, irritability, negativism, and refusal of food.

Our neuroimaging studies revealed cortical atrophy in 24 (24%) of the patients with the expansion of the ventricles and correlated with the degree of dementia. The atrophic process is strongly expressed in the temporal and frontal regions.

## Discussion

The incidence of dementia in Parkinson's disease is highly variable. This may be due to the fact that studies have been conducted on different populations and different diagnostic criteria have been used. However, the diagnosis of dementia has also increased in recent years [4,5]. According to the consensus; the diagnosis of "dementia in Parkinson's disease" is made when the signs of dementia develop 12 months after the onset of Parkinson's disease.

The diagnosis of depression does not exclude the diagnosis of dementia and vice versa. Depression and dementia often combine and mask each other. In elderly patients (and especially in patients with Parkinson's disease) it is difficult to differentiate depression from atrophic processes of the brain, there are no complaints from patients about low levels of mood, abandonment, and loneliness which appear in the background, patients mostly speak about disorientation, loss of memory, difficulties of concentrating. Sometimes these symptoms are not associated with dementia but are with depression. According to our study depression was not associated with the degree of disability or the duration of the disease and may be related to disorders of the dopaminergic system and the frontal lobe.

## Conclusion

In Georgia, Parkinson's disease patients suffered from significant cognitive impairment. The results of our study indicate that patients with Parkinson's disease have a relatively high rate of both depression and the degree of dementia. Symptoms of depression and dementia appear shortly after the onset of the disease. There is a need for further research.

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