



## Non-Motor Symptoms of Parkinson Disease

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Received Date: 27 January, 2022, Manuscript No. RRPY-22-54212;

Editor assigned Date: 31 January, 2022; Pre QC No. RRPY-22-54212 (PQ);

Reviewed Date: 10 February, 2022, QC No. RRPY-22-54212;

Revised Date: 15 February, 2022, Manuscript No: RRPY-22-54212 (R);

Published Date: 25 February, 2022, DOI:10.4172/rpy.1000316

### Introduction

Parkinson's Disease (PD) is the second most common neurodegenerative disease, affecting approximately 1.7% of people over 65 years of age. PD is rare before age of 50 years and reaches a prevalence of 4% in the highest age. PD is a complex, debilitating disease characterized by motor symptoms of tremor, stiffness, bradykinesia, and postural instability, and may be accompanied by various non-motor symptoms ranging from neuropsychiatric symptoms to autonomic and sensory dysfunctions and sleep disorders. PD generally begins in the second half of life with a slight male predilection. The cause remains unknown to this day, but Parkinson's syndromes are known, which can be of various origins (degenerative, infectious, toxic, and genetic). PD is characterized by a loss of pigmented dopaminergic neurons in the compact part of the substantia nigra and by the presence of Lewy bodies. Biochemically, it is a collapse of the nigrostriatal dopaminergic system, with a clinical threshold of more than 80% of the potential loss of the system, unbalancing many neural circuits, not just motors. Other neurotransmitters are also altered in PD, especially cholinergic neurotransmission, is being affected. Therefore, the deficiency of the cholinergic circuits partly explains the deterioration of memory (Meynert's basal nucleus). On the other hand, the insufficiency of the serotonergic and noradrenergic systems (locus coeruleus) could contribute to akinesia and phenomena of freezing but could be involved in the appearance of a depressive syndrome that is present in 20 to 40% of patients. Up to 90% of persons with PD experience psychiatric complications. These patients, throughout their PD, experience neuropsychiatric disturbances, including depression, anxiety, sleep disturbances, psychosis, and behavioural and cognitive changes. For patients and families, these neuropsychiatric disturbances are often more problematic and distressing than the motor aspects of PD.

### Non-motor Symptoms of Parkinson's disease

Non-motor symptoms of Parkinson's disease are divided into several categories, namely autonomic dysfunction, cognitive and psychiatric symptoms, sleep disturbance, and other symptoms. Symptoms such as olfactory dysfunction, constipation, and depression can be early signs of occurrence motor symptoms of Parkinson's disease. Hallucinations and dementia occur in advanced Parkinson's disease.

### Autonomic dysfunction

Autonomic dysfunctions that can occur in Parkinson's disease are excessive salivation and sweating, odorless dysfunction, olfactory dysfunction, hiccups, difficulty swallowing, nausea, vomiting, constipation, fecal incontinence, bladder dysfunction, and weight loss or increase.

**Excessive saliva and sweat:** Excessive salivation affects about 10% of all patients with Parkinson's disease and excessive sweating in 30 to 50% of patients. Patients who experience excessive salivation can experience complications from hiccups and pneumonia. Patients with Parkinson's disease can experience excessive sweating on the whole body not limited to the armpits, palms or feet, and face. Excessive salivation in Parkinson's disease mainly results from impaired mouth movements and swallowing rather than excessive production. This is a result of akinesia in Parkinson's disease. Excessive sweating occurs when stiffness (off period) muscle and dyskinesia (on period).

**Smelling and Olfactory Dysfunction:** Smelling and olfactory dysfunction occurs in about 90% of patients with Parkinson's disease. One of olfactory dysfunction, hyposmia, is often an early sign of motor symptoms of Parkinson's disease. These symptoms are not too serious but, in some cases, this dysfunction can cause a decrease in appetite.

Degeneration of the anterior olfactory nucleus and olfactory bulb can cause olfactory dysfunction. The sense of smell loses its smell due to this disorder. Smoking, head trauma, and other neurodegenerative conditions can also cause this olfactory dysfunction.

**Hiccups and Difficulty Swallowing:** Hiccups and difficulty swallowing are experienced by about 50% or half of all patients with Parkinson's disease. The patient will experience mild swallowing disorders in the early stages and severe dysphagia in the advanced stages. Patients feel disturbed when swallowing food, water, or pills and can experience complications of malnutrition, pneumonia, or hiccups. Hiccups and difficulty swallowing in patients with Parkinson's disease are mostly caused by impaired bolus transport through the pharynx. Oral pharyngeal dysphagia can be associated with weak activation of the tongue and cheek muscles and imperfect relaxation or uncoordinated coordination of the upper esophageal sphincter.

**Nausea and Vomiting:** This symptom is experienced by about 20% of all patients with Parkinson's disease. Patients can feel the sensation of flatulence when nausea vomiting when using a new antiparkinson drug. Flatulence can also occur without consuming drugs because of decreased stomach movements.

Sensation of flatulence in patients with the disease Parkinson's associated with degeneration of autonomic neurons in the peripheral nervous system (Meissner plexus) and brain stem. Nausea and vomiting can be a primary symptom in Parkinson's disease but are generally caused by side effects from dopaminergic drugs or other Parkinson's drugs.

**Constipation:** The prevalence of constipation in patients with Parkinson's disease is around 75%. Constipation is often the first sign of motor symptoms. Patients with these symptoms can experience complications in the form of megacolon, pseudo-obstruction, volvulus, abdominal perforation, and distress. This causes severe constipation

not to be tolerated. Constipation is a symptom of dysautonomia and is mainly caused by a decrease in colonic motility and ano-rectal dysfunction. Degeneration of peripheral autonomic nuclei and brain stem causes constipation. Parasympathetic cholinergic denervation can

cause sphincter dyssynergia i.e., damage to the relaxation coordination of the anal sphincter which subsequently results in the inability to defecate normally.