

# Second Most Common Neurological Disorder: Parkinson's Disease

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## Key Points

- What is Parkinson's disease?
- Difficulties in treating
- Latest Clinical practices.
- Parkinson's and COVID 19
- Effect of Parkinson's on mitochondria.

Parkinson's disease (PD) is a progressive neurodegenerative disease characterized by a wide range of autoimmune and non-motorized symptoms leading to paralysis and low quality of life despite the best treatment. Parkinson's disease is the second most common neurological disease and its increase is expected to double in the next 30 years. Accurate diagnosis of Parkinson's disease remains a challenge and the diagnosis of the early stages of the disease is ongoing.<sup>1</sup>

### Mitochondrial dysfunction in Parkinson's disease:

Mitochondrial dysfunction is implicated in PD through both environmental exposure and genetic factors.

Recent studies of large numbers of patients with PD have shown peripheral mitochondrial and lysosomal dysfunction, and, importantly, overdose and phenotypes seen in family diseases.<sup>2</sup>

### Parkinson's and COVID 19:

Older people with advanced PD are at greater risk for a serious respiratory illness. The effects of stress, anxiety and social isolation may also have a negative impact on parkinsonian symptoms, leading to a second deterioration.

### Are PD patients at higher or lower risk for contracting COVID-19:

COVID-19 affects older patients with severe chronic conditions, but it is not known whether PD itself is dangerous.

A case-control study of 1,486 PD patients and 1,207 family members in Italy demonstrated no difference in COVID-19 rates (7.1%vs 7.6%). Accordingly, another study conducted in Germany, reported up to 73%of PD patients were compliant with social distancing, and that the proportion was higher in older patients, probably in light of perceived higher risk.<sup>3</sup>

PD patients receiving COVID-19 are more likely to be obese, have lower COPD, and are less likely to take vitamin D supplements than those who do not have COVID-19. Obesity and chronic obstructive pulmonary disease are well documented by risk factors in some populations and poor association with vitamin D support the suspicion that hypovitaminosis D may contribute to COVID-19 risk. Vitamin D deficiency is common in PD.<sup>3</sup>

### Treatment:

Significant progress has been made in the development of diagnostic criteria, and genetic and imaging testing is already a part of routine clinical practice, while new tissues and fluids are still being investigated. Parkinson's disease is changing from a clinical to a biomarker-supported diagnostic enterprise, where early detection is possible, different strains with different predictions are being identified,

and new therapies for mutating diseases are developing.

Neurotrophic factors (NTFs) are small secreted proteins that support the development, maturation and survival of neurons.<sup>4</sup>

#### **Types of NTFs:**

There are four effective NTFs, glial cell-derived neurotrophic factor (GDNF), neurturin (NRTN), platelet-derived growth factor (PDGF-BB), and cerebral dopamine neurotrophic factor (CDNF) which was tested in PD. patients, with a strong focus on GDNF and CDFN.<sup>4</sup>

#### **Advantages of NTFs:**

- NTFs are able to slow down neurodegeneration and reverse the diseases.
- Supplementation of NTFs can protect affected neurons in the animal models of neurodegenerative diseases.
- NTFs regulate the functional activity of neurons. This is achieved by regeneration of neuronal axons, stabilization and stimulation of synapses and regulation of the synthesis and release of neurotransmitters and expression of their transporters.<sup>4</sup>

#### **References:**

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