Chapter 2
Symptomatology and Clinical Features of Parkinson's Disease

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ABSTRACT

Parkinson's disease (PD) is a progressive neurodegenerative disease representing the most common movement disorder worldwide. It is characterized clinically by its cardinal motor features: bradykinesia, rigidity, postural instability, and resting tremor. The clinical diagnosis of PD is mainly based on the presence of these motor symptoms which differentiate it from the other forms of parkinsonism. However, recently other symptoms known as non-motor symptoms (NMS) are ginning attention because of their

DOI: 10.4018/978-1-6684-5156-4.ch002

negative outcome on PD patients, and they are now included in the clinical diagnosis of the disease. Current lines treatments are generally based on DA replacement and are associated with significant alleviation of motor symptoms and some NMS. However, such treatments have not been shown to decrease or halt the disease progression. Moreover, as the disease progresses, these symptomatic treatments can worsen the disease diagnosis and management.

INTRODUCTION

Parkinson's disease (PD) is the second most common neurodegenerative disease and the commonest movement disorder worldwide. Clinically, PD is characterised by its cardinal motor symptoms which are Akinesia/bradykinesia, muscular rigidity, postural instability and resting tremor. It is highly established that these motor symptoms are caused by the degeneration of the dopamine (DA) producing neurons of the substantia nigra pars compacta (SNpc) of the midbrain leading to the nigrostriatal pathway dysregulation (Surmeier, 2018; Desai *et al.*, 2019 ; Gelders *et al.*, 2018). It is believed that during the onset of these cardinal motor symptoms, around 80% of dopaminergic neurons are already degenerated (Chung *et al.*, 2001). The current standard diagnosis of PD is clinical and the disease is usually diagnosed by the first motor symptoms.

The progression of symptoms in PD is highly variable among patients (Poewe, 2006). Indeed, one of the main issues in PD diagnosis is that every patient is different regarding the symptoms, severity, and progression; hence, it is even sometimes said that each patient has his or her own version of PD (Sveinbjornsdottir, 2016b). However, the presence of PD cardinal motor features is essential in order to differentiate PD from related parkinsonian disorders. Another important thing that can help to distinguish PD from the other parkinsonian syndrome is that most motor symptoms of PD are responsive to dopaminergic therapy and the main confirmation of PD identification is the positive response to dopaminergic therapy (D'costa *et al.*, 1995; Váradi, 2020).

Although in recent decades there have been large advances in symptomatic therapy of PD, therapies that will halt or slow the progression of the disease remain challenging (Poewe and Mahlknecht, 2009). With the disease progression, other motors and non motor symptoms (NMS) appear either as a result of the disease course or as complications of these pharmacologic testaments which eventually worsen both PD diagnosis and management. The NMS of PD includes sleep disorders, neuropsychiatric dysfunction, sensory symptoms, cognitive impairment, and dementia among others are also associated with poor quality of life (Schapira *et al.*, 2017; Ja *et al.*, 2012; Ziemssen and Reichmann, 2007). Additionally, most if not all PD symptoms are progressive, and their management is of great importance. In this chapter, the critical features of PD and their utilization in the clinical diagnostics are discussed.

PD Symptoms: A General Overview

PD is a multi-system, progressive neurodegenerative illness that primarily affects patients in their later years of life. In industrialised countries, the prevalence of PD is estimated at 0.3% of the total population and at roughly 1% in those over 60 (Lau, 2006). For both men and women, the prevalence rises