

Psychological Treatment Considerations for Early versus Late-Stage Parkinson's Disease

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ABSTRACT

Parkinson's Disease (PD) is a neurodegenerative disorder that is estimated to impact at least one percent of persons over the age of sixty. Loss of dopaminergic neurons in the substantia nigra results in neurological symptoms, including the characteristic motor symptoms seen in Parkinson's Disease. In addition to the distressing motor symptoms, neuropsychiatric symptoms and treatment-related symptoms are common features of Parkinson's Disease. Symptom constellations vary from early-stage to late-stage and necessitate that treatment approaches evolve throughout disease progression. Given the range of psychological and cognitive challenges posed by Parkinson's Disease, health psychologists must recognize relevant symptomology and utilize appropriate tools to manage the everchanging psychological sequelae. When done effectively, psychologists can play a critical role in the management of psychological symptoms and the improvement of quality of life for individuals diagnosed with Parkinson's Disease. This review provides an overview of the Hoehn and Yahr rating system for staging Parkinson's Disease, discusses the psychiatric comorbidities associated with various stages, and offers psychological treatment approaches that are appropriate for each stage.

Keywords: Parkinson's Disease(PD), Neurodegenerative Disorder, Health Psychology, Non-Motor Symptoms, Neuropsychiatric Symptoms

Parkinson's Disease (PD) is a progressive neurodegenerative disorder with unknown pathogenesis, though oxidative stress has a demonstrated association with disease progression [1,2]. Other potential risk factors in the development of PD include lifestyle factors like stress levels and water intake, tobacco use, alcohol consumption, caffeine intake, and use of non-steroidal anti-inflammatory drugs [3]. Parkinson's Disease is the second most common neurodegenerative disorder associated with aging, and rates of PD are expected to rise by 50% in the next decade as the population continues to age [1,3]. Incidence rates of PD range from eight to eighteen per 100,000, and the disease impacts males at a greater rate than females. Parkinson's Disease incidence rates make it the most common movement disorder. PD includes motor and nonmotor symptoms and is characterized by tremors, akinesia, bradykinesia, rigidity, and postural instability [3].

Development and progression of PD are associated with a loss of dopaminergic neurons in the substantia nigra and

pathological aggregation of Lewy bodies [3]. As Parkinson's Disease progresses, there are a range of distressing motor symptoms, psychological symptoms, and treatment-related symptoms that can occur [4]. Neuropsychiatric symptoms like depression, anxiety, sleep disturbances, apathy, and mild cognitive impairment are commonly reported in PD. Additional neuropsychiatric symptoms like psychosis and impulse control disorders (ICD) may also be present in PD. In fact, it is not uncommon for some neuropsychiatric symptoms to be present prior to a formal diagnosis of Parkinson's Disease. Some of these symptoms will also worsen or emerge over the course of a PD progression [5].

As the disease progresses, there is a need to adapt treatments, both medical and psychological, to the phase that a patient is in. This review will examine the Hoehn and Yahr stages of Parkinson's Disease and describe the psychological treatments that may be utilized in each phase, highlighting the critical role that health psychologists play in addressing the evolving psychological, emotional, and behavioral needs of individuals with Parkinson's Disease. This paper will describe the five stages of PD before examining broad categorizations of early-stage versus late-

stage Parkinson's Disease. There will be a review of associated symptoms in each stage and treatment considerations for the stages, noting the evolving nature of treatment as PD progresses.

Stages of Parkinson's Disease

Early-stage Parkinson's Disease

Parkinson's Disease is conceptualized through the Hoehn and Yahr (H&Y) scale, with stages traditionally progressing from one to five [6]. The five-point scale was replaced with a seven-point scale in the 1990's [7]. The H&Y scale is considered the gold standard in the development of new scales to measure disease rating and quality of life in PD. Patients experience variability in the transition from one stage to the next. However, general symptomology exists for early-stage and late-stage PD [7].

Stage 1

In stage one of PD, motor symptoms are mild and unilateral [6]. Bradykinesia is a core feature of PD. In order to diagnose OD, one additional symptom must be present with bradykinesia. The other motor symptom can manifest as tremors, which are often present early in PD, or rigidity [8]. Non-motor symptoms in stage one typically can include olfactory dysfunction, like anosmia, rapid eye movement sleep behavior disorder (RBD), autonomic dysfunction, anxiety, and depression [9].

Stage 2

Once the disease has progressed into stage two, symptoms impact both sides of the body. Despite the presence of bilateral motor symptoms, stage two PD generally causes only minimal physical disability and does not tend to impair balance or quality of life significantly [6]. Low mood and sleep disturbances often increase in stage two. Early detection and treatment of depression is vital, as it precedes motor symptoms, and early intervention can greatly improve patients' quality of life [10].

Intermediate Stage Parkinson's Disease

As patients progress from early-stage to intermediate PD, the disease burden increases significantly, and healthcare resource utilization increases. Despite the impact of all stages of PD on the healthcare system, early-stage and late-stage PD are the focus of most research efforts [11]. As such, the scope of this review will focus primarily on the early- and late-stage features and treatment considerations of Parkinson's disease, though a description of intermediate disease progression will be provided for context.

Stage 3

Stage three tends to mark a turning point in PD, ushering in more debilitating changes. Cognitive impairment may emerge as PD progresses and is expected to continue to increase through late-stage PD [5]. Notable symptoms in stage three include mild to moderate disease progression and balance impairment [6]. Postural instability is present, though the individual remains physically independent in this stage [12]. While the H&Y scale does not track non-motor symptom progression, these are important indicators to watch for and adapt treatments for as the disease progresses.

Late-stage Parkinson's Disease

This point in PD progression can be extremely distressing, and health psychologists can be helpful in helping patients

and their care partners cope. Along with cognitive decline and reduced dopaminergic activity, patients with late-stage PD may experience impulse control disorders (ICDs). It is hypothesized that impulsivity is associated with loss of pleasure due to dopamine deficiencies, and a predisposition to ICDs is associated with aspects of cognitive decline [13].

Stage 4

Stage four on the H&Y scale is characterized by severe motor symptoms and physical disability, like rigidity and bradykinesia [6,12]. Significant non-motor symptoms also accompany this stage, with hallucinations, delusions, and severe mood disturbances becoming increasingly common and worsening with disease progression [14]. Up to 75% of patients with Parkinson's Disease will experience visual hallucinations, with some patients also reporting tactile, gustatory, or olfactory hallucinations co-occurring. Worsening hallucinations are also associated with further cognitive decline and increased risk of death as the patient's disease progresses. It is challenging to treat hallucinations in PD. Unfortunately, treatment for motor symptoms can often trigger these perceptual symptoms, and antipsychotic drugs, in turn, worsen PD symptoms [14].

Stage 5

Motor symptoms in stage five are the most advanced, and the individual is often wheelchair-bound or bedridden at this point [6,12]. Severe motor dysfunction, cognitive decline, hallucinations, and other neuropsychiatric symptoms are associated with motor impairments. Patients with Parkinson's Disease become physically dependent on caregivers to perform activities of daily living, and caregivers may experience increasing levels of burnout as a result [15].

In addition to the motor challenges, non-motor symptoms can be exceedingly distressing for caregivers, including depression, psychosis, dementia, hallucinations and delusions, cognitive impairment, apathy, and sleep disturbances. O'Fallon highlighted the limited amount of available research into the quality of life for caregivers of those with PD [15]. The current literature notes that cognitive deterioration, motor challenges, speech difficulties, and neuropsychiatric symptoms tend to be positively associated with levels of caregiver distress as PD progresses [15].

Treatment Considerations: Early versus Late-Stage Parkinson's Early-stage Parkinson's Disease

There are neuropsychiatric symptoms that emerge at various points in the progression of Parkinson's Disease [16]. Some symptoms like depression and anxiety tend to accompany PD from premotor stages through to late-stage disease. Other symptoms, like apathy, are present early in the diagnosis and progression of PD [16].

Depression

Depression impacts an estimated 35% of patients with PD [16]. The pathophysiology of depression in PD is associated with changes in dopaminergic, noradrenergic, and serotonergic systems. Other considerations in the development of depression in PD include the reduction of cortical cholinergic neurons and, in early PD, reaction to news of the diagnosis [16]. While motor symptoms lead to the diagnosis of PD, depression often accompanies these symptoms [10].

The role of health psychologists in early-stage PD may include supporting the diagnosis of the disease by identifying the non-motor symptoms present [10]. Following diagnosis, it is common for depression to develop or progress. Health psychologists can support patients through their emotional responses to early PD, helping to process symptoms like grief, denial, or fear of disease progression [10]. In addition to psychoeducation, cognitive behavioral therapy (CBT) has proven effective in managing mood disorders and depressive symptoms in those with PD [16]. Zarotti and colleagues described meta-analytic findings related to the treatment of depression in PD [4]. CBT was deemed superior to psychoeducation alone in multiple studies. Therefore, it is advisable to utilize psychoeducation to supplement therapeutic interventions. Psychoeducation can prove beneficial in promoting healthy coping strategies and stressing the importance of treatment adherence and lifestyle changes in early-stage PD [4]. Another useful technique in managing symptoms in late-stage PD is adopting a mindfulness-based practice [17]. In a study by van der Heide and colleagues, 38.7% of PD respondents utilized mindfulness techniques and noticed an improvement in both motor and non-motor symptoms [17].

Anxiety

Anxiety impacts up to 60% of individuals diagnosed with PD [16]. There is a risk of underdiagnosing anxiety in Parkinson's Disease, beginning with its emergence in the premotor phase. Anxiety is dominantly present in off-periods and may manifest as "episodic anxiety" [16]. A meta-analytic review by Zarotti and colleagues examined what non-pharmacological, therapy-based interventions were most effective in treating anxiety through the course of PD [4]. As with depression, a significant reduction in anxiety symptoms is associated with the utilization of CBT interventions. Additionally, interventions like mindfulness-based approaches, Behavioral Relaxation Training (BRT), and Acceptance and Commitment Therapy (ACT) yielded clinically meaningful reductions in symptoms of anxiety [4].

Apathy

Apathy is an often-overlooked symptom in early-stage PD, despite its prevalence in nearly 40% of PD patients, as it can present in subtle ways [18]. It is understood that there are emotional, cognitive, and behavioral aspects to apathy in PD. While multiple pharmacologic treatments have been utilized in the control of symptoms associated with apathy, there are limited non-pharmacologic treatments. At present, mindfulness interventions like Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) are the premier treatments for individuals without cognitive impairment [18].

Late-stage Parkinson's Disease

In addition to changing and worsening motor symptoms, neuropsychiatric symptoms in late-stage PD also increase in number and severity [16]. Some symptoms are present from premotor to late-stage disease, like anxiety and depression, while others emerge at various stages of PD. Dementia and psychosis are typically associated with late-stage disease. Impulse control disorders are often associated with dopaminergic therapy, which usually begins when motor symptoms begin to significantly impact an individual's daily life and motor function [16,19].

Depression

As previously stated, depression is common in PD [16]. In addition to the aforementioned pathophysiology, depression is also associated with worsening disability. This effect tends to occur later in the disease progression as individuals lose mobility and independence [16]. As in early-stage PD, CBT remains the standard of care for treating depression in late-stage disease [4]. While it is unlikely that all symptoms of depression may be eradicated, therapists can adopt a strengths-based approach to improve outcomes and foster resilience, orient the patient toward personal goal achievement, and nurture a sense of optimism and hope [10].

Dementia

In the later stages of PD, dementia can present with frontal executive dysfunction and visuospatial dysfunction [16]. More than 80% of individuals with PD will develop dementia. Risk factors for dementia in PD may include Lewy body pathology [16]. Non-pharmacological treatments for PD dementia include cognitive training, music and art therapy, non-invasive brain stimulation, and cognitive rehabilitation [20]. Cognitive rehabilitation is used to increase cognitive reserve and slow the development of further cognitive impairment. Individualized cognitive rehabilitation plans can help patients adapt to manage life with their cognitive deficits. Lastly, group-based cognitive stimulation therapy may also be used to improve cognitive performance [20].

Psychosis: Hallucinations and Delusions

Psychosis in PD most commonly manifests as visual hallucinations and is often related to treatment with dopaminergic therapies [16]. In many cases, psychosis is difficult to treat in Parkinson's disease. Given its association with medication used in the treatment of PD, reduction of said medications may decrease psychotic symptoms but have a negative impact on disease management. Furthermore, medication options used in de novo psychosis may worsen PD symptoms, particularly motor symptoms. Non-pharmacological interventions for psychosis in PD include electroconvulsive therapy (ECT), counseling for patient and caregiver, and environmental and behavioral modifications [16].

Impulse Control Disorders

Impulse control disorders impact anywhere from 35 to 60% of individuals with PD [16]. Symptoms of ICD may include misuse of dopaminergic drugs, compulsive spending, gambling, eating, and hypersexual behavior. Dopamine replacement therapy may play a role in the etiology of ICD in PD [16]. Treatment with cognitive behavioral approaches showed mixed results in those experiencing ICD [4]. Spousal and child safety are concerns when dealing with ICD in PD [21]. It is recommended that the treatment of ICD include a pharmacological intervention paired with CBT or other therapeutic intervention. Transcranial magnetic stimulation (TMS) has also shown some efficacy in treating ICD [21].

Other Considerations

Parkinson's Disease takes a tremendous toll not just on those who are diagnosed with the disease but also on those who love and care for those individuals [22]. There is a critical need to support the caregivers of individuals with PD. As PD progresses,

caregivers are exposed to worsening mood and depressive symptoms, challenging cognitive decline, physical demands of supporting the patient while motor symptoms worsen, and troublesome hallucinations and delusions. Psychologists can help manage emotional distress and caregiver burnout [22]. In addition, psychological support may involve family counseling to help families cope with grief and loss. Various therapeutic interventions have been studied in working with families of patients with PD. Narrative therapy, Solution-Focused Brief Therapy (SFBT), and Emotionally Focused Therapy (EFT) have shown significant improvement in quality of life and reduction of distress in families impacted by PD [23].

Conclusion

Parkinson's Disease is a progressive neurodegenerative disorder with motor and non-motor symptoms. Given the complex and evolving nature of the disease, it is helpful to utilize a multidisciplinary approach to treatment. Health psychologists can provide valuable support to patients and care teams as they navigate PD. To effectively manage PD, psychologists must be aware of the differences that emerge in various stages of Parkinson's Disease and remain versed in evidence-based treatments that are most appropriate for the given stage. Despite the long history of PD research, further research can improve the treatments and outcomes of Parkinson's Disease. Furthermore, continued research can address gaps in the literature, including how to best integrate psychological treatment into the standard of care for PD.

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