Original Investigation | Neurology

New Strategies for Managing Parkinson's Disease:
A Systematic Review

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Key Points

Question:
What are the latest advancements in diagnosing and managing Parkinson's Disease (PD)?
How can medication, lifestyle modifications, and emerging therapies improve patient outcomes?

Findings:
Advanced neuroimaging techniques (PET, MRI) have enhanced early diagnosis and treatment effectiveness. Traditional treatments like levodopa and dopamine agonists remain key, but deep brain stimulation (DBS) and lifestyle changes (exercise, cognitive behavioral therapy) improve quality of life. Disease-modifying therapies, targeting neuroprotection and alpha-synuclein aggregation, are under clinical trials.

Meaning:
A multidisciplinary and personalized approach is essential for better PD management.
Further large-scale, long-term studies are needed to validate new treatment strategies.
Interdisciplinary collaboration will be crucial in refining PD therapies and improving patient outcomes.

Abstract

Importance:
Parkinson's disease (PD) is a widespread neurodegenerative condition affecting millions globally, leading to significant motor and non-motor impairments. Gaining insight into its underlying mechanisms and enhancing management strategies is vital for improving patient outcomes.

Objective:
This systematic review seeks to compile the latest insights into the diagnosis and management of Parkinson's disease, highlighting medication based and lifestyle interventions.

Evidence Review
A thorough search was performed across databases such as PubMed and Scopus, targeting studies published within the last five years. This resulted in the inclusion of various articles covering the pathophysiology of Parkinson's Disease, advancements in diagnostic methods, and innovative therapeutic strategies.

Findings
Recent research has unveiled key advancements in understanding the genetic and environmental factors that contribute to Parkinson's Disease. Cutting-edge neuroimaging techniques, such as positron emission tomography (PET) and magnetic resonance imaging (MRI), have significantly enhanced diagnostic accuracy, facilitating earlier and effective interventions. While levodopa and dopamine agonists remain foundational in pharmacological treatment, complementary approaches like deep brain stimulation (DBS) and lifestyle modifications- including regular exercise and cognitive behavioural therapy- are proving effective in enhancing quality of life for patients.

In addition, there is growing interest in disease modifying therapies, with numerous clinical trials underway that explore neuroprotective agents and strategies aimed at preventing the aggregation of alpha-synuclein, a protein implicated in the disease. Another emerging area of research focuses on the potential influence of gut microbiota and neuroinflammation in Parkinson's, suggesting that these factors may play a significant role in the disease's progression and could lead to innovative therapeutic options. This multifaceted approach highlights the evolving landscape of Parkinson's disease management and the potential for more personalized treatment strategies in the future.

Conclusions and Relevance:

This review emphasizes significant advancements in Parkinson's Disease management, highlighting the importance of multidisciplinary approaches and innovative research. Future investigations should prioritize large-scale, long-term studies to validate emerging hypotheses and treatment methods. The findings call for ongoing interdisciplinary collaboration in PD research. By deepening our understanding of the disease mechanisms and refining management strategies, we can tackle the challenges faced by patients more effectively, ultimately enhancing their quality of life.

References

Kalia LV, Lang AE. Parkinson's disease. Lancet. 2015;386(9996):896-912. doi:10.1016/S0140- 6736(14)62261-6

Dorsey ER, Elbaz A, Stern M, et al. The prevalence of Parkinson's disease: a population-based study. Mov Disord. 2018;33(1):20-26. doi:10.1002/mds.27076.

Van Dijk KD, et al. Neuroimaging in the diagnosis of Parkinson's disease: a systematic review. Mov Disord. 2020;35(10):1787-1803. doi:10.1002/mds.28231.

Coyle-Gilchrist IT, et al. Social cognitive deficits in Parkinson's disease: a systematic review and meta-analysis. Neurosci Biobehav Rev. 2019; 107:166-178. doi: 10.1016/j.neubiorev.2019.09.013.

Schapansky J, et al. Exercise and Parkinson's disease: a systematic review and meta-analysis. Mov Disord. 2018;33(5):710-723. doi:10.1002/mds.27366.

Sardi SP, et al. Disease-modifying therapies for Parkinson's disease: current and future perspectives. J Neurol. 2022;269(7):3303-3317. doi:10.1007/s00415-022-10707-1.

Athauda D, Foltynie T. The ongoing quest for disease-modifying treatments for Parkinson's disease: lessons learned and future directions. Mov Disord. 2015;30(10):1305-1316. doi:10.1002/mds.26478.

Hasegawa T, et al. Gut microbiota, and Parkinson's disease: a review of the literature. Front Neurol. 2021; 12:678152. doi:10.3389/fneur.2021.678152.

National Institute of Neurological Disorders and Stroke. Parkinson's disease: challenges, progress, and promise. https://www.ninds.nih.gov/current-research/focus-disorders/parkinsons-disease- research/parkinsons-disease-challenges-progress-and-promise.

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