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Rachel Duncan
University of North Dakota

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Lifestyle Changes and Medication vs. Medication Alone: Symptom Control of Parkinson Disease

Rachel Duncan, PA-S and Julie Solberg, PA-C

Department of Physician Assistant Studies, University of North Dakota School of Medicine & Health Sciences

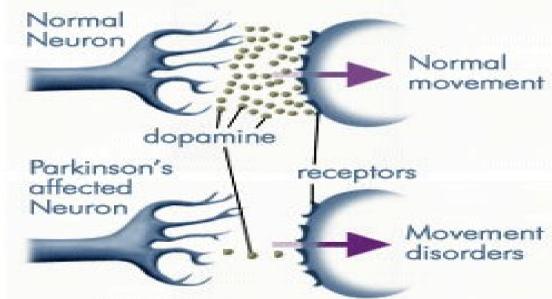
Grand Forks, ND 58202-9037



Abstract

Parkinson disease is multifactorial and predominantly affects the geriatric population. The mainstay of treatment for patients diagnosed is currently symptomatic treatment with dopamine replacement. The goal of this literature review is to identify possible lifestyle modifications that can delay progression of the disease or help prolong OFF time of symptoms. Lifestyle modification predominantly considered during this review included diet and physical activity. Included in the study were MIND, Mediterranean, and DASH diets. Considering the role of medication in this disease levodopa, dopamine agonists, monoamine oxidase B inhibitors and the addition of ropinirole to levodopa and their efficacy in treating parkinsonian symptoms was investigated. A literature review was conducted using electronic search database including, PubMed, Clinical Key and DynaMed. After thorough review of 12 articles regarding management of Parkinson disease with various modifications along with medications it was found lifestyle modifications are not significant in the management of Parkinson disease alone. However, there is evidence to support the benefits lifestyle modifications can have, including diet and physical activity, for those diagnosed with Parkinson disease. The addition of these changes have shown the possibility of reducing the OFF time in the disease as well as reducing the daily medication regimen needed.

Dopamine levels in a normal and a Parkinson's affected neuron.



Bazazeh, Dana & Shubair, Raed & Malik, Wasim. (2016). Biomarker Discovery and Validation for Parkinson's Disease: A Machine Learning Approach. 10.1109/BIOSMART.2016.7835465.

Introduction

Parkinson disease was first described as a neurological condition in 1817 by James Parkinson. Parkinson disease is a movement disorder that occurs predominantly due to loss of dopaminergic neurons in the pars compacta region of the substantia nigra. The disease is characterized by presence of tremor, rigidity, bradykinesia, impaired posture and balance, impaired sleep, depression, loss of automatic movements, speech changes, writing changes as well as GI changes.

GI changes can include drooling, cramping, abdominal pain, vomiting, bloating, dyspepsia, constipation, and fecal incontinence.

Among those 65-69 years old the prevalence of Parkinson disease is 0.5-1% with an increased prevalence of 1-3% in those 80 years and older, with incidence being higher in men compared to women. The prevalence and incidence of this disease is expected to rise by more than 30% by 2030 (Chen, 2001). Currently, the treatment focuses on symptomatic relief with medications to restore dopamine levels or to act on the postsynaptic dopamine receptors. The purpose of this literature review is to identify if lifestyle modifications in the form of diet changes and physical activity can be beneficial in reducing symptoms and progression of the disease

Research Question

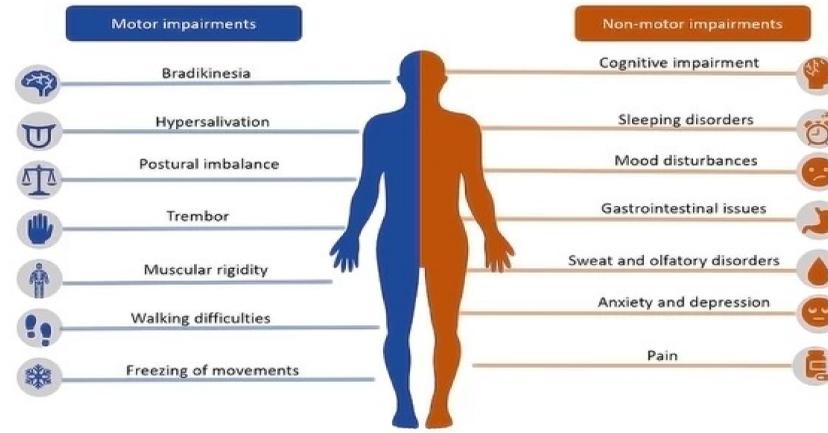
How does lifestyle modification and medications alter progression/symptoms of Parkinson disease compared to the standard of care of medication treatment alone?

Statement of the Problem

Management of Parkinson Disease is complex and multifactorial. The pathophysiology of the disease is not well understood, aside from recognizing the need for dopamine replacement. The standard of care treatment for Parkinson disease is management of the symptoms with medication as each component presents. This can be difficult as it leads to polypharmacy and taking medications multiple times a day. This is especially troublesome as the prevalence of this disease affects the geriatric population. Having indications for lifestyle changes may be beneficial to lessen the burden of early and frequent medication use in Parkinson disease. This will be beneficial as early prescribing of levodopa-carbidopa can lead to tolerance and the need for higher/more frequent dosing of the medication as well as potential for additional medications sooner. Lastly, as this disease primarily affects the geriatric populations, multiple medications, dosed multiple times a day can lead to non-compliance simply due to forgetting to take or the difficulty of tracking medications throughout the day.

Literature Review

- **Lifestyle modifications:**
 - MIND diet can be associated with a decreased risk of parkinsonism and a slower rate of parkinsonism progression (Agarwal et al., 2018)
 - Mediterranean diet was shown to marginally reduce progression and the DASH diet was not associated with a progression or reduced progression of parkinsonism (Agarwal et al., 2018)



StoryMD. (n.d.). Parkinson disease symptoms. StoryMD.com. <https://storymd.com/asset/JA0QxXHO9-parkinson-disease-symptoms?newsletter=show>

- Metcalfe-Roach et al. (2020) suggest that the MIND and Mediterranean diet may be effective at delaying the onset and progression of Parkinson's
- There is a lower probability for prodromal Parkinson disease with adherence to the Mediterranean diet when compared those that do not follow closely to the diet (Maraki et al., 2019)
- Adherence to the Mediterranean diet showed an inverse relationship with prodromal features including constipation daytime sleepiness and depression (Moldberry et al., 2020)
- Physical activity both prior to diagnosis and throughout diagnosis has shown a reduction in mortality versus those who are inactive (Rusch et al. 2021)
- **Medication use**
 - Use of extended release CD-LD significantly improves OFF and ON time without troublesome dyskinesia compared to CD-LD IR (Hauser et al., 2013)
 - Use of ropinirole can reduce the average dosage of levodopa along with the awake time spent OFF (Lieberman et al., 1998) (Pahwa et al., 2007)
 - Early pharmaceutical use of levodopa

Conclusion

Management of Parkinson Disease is complex and multifactorial. After thorough research it can be determined that primary management of Parkinson disease is with pharmaceutical treatment. There is minimal evidence to show that lifestyle changes alone can effectively manage the disease. Research did show that lifestyle modifications such as diet and physical activity, can be beneficial, however, it is not significant enough to discontinue medication use. Further research should be completed to include long term effect of lifestyle changes in the middle age population and the effect it has in potential later onset of parkinsonian symptoms.

Discussion

In this comprehensive review of literature, comparing standard of care of medication treatment to the initiation of lifestyle changes on the effects of Parkinson Disease it was found that lifestyle changes can have a clinically significant benefit. Specifically, after analysis of the data, initiation of the MIND and Mediterranean diet can help to reduce prodrome symptoms of Parkinson disease as well as symptoms of Parkinson disease for those already diagnosed.

These lifestyles change considerations showed improvement in both prodrome symptoms, as well as in those who were previously diagnosed with Parkinson disease. In addition, the changes showed improvement not only in dyskinesias but also with constipation, depression, urinary dysfunctions, and daytime somnolence

The concern with the early use of levodopa carbidopa is the earlier onset of dyskinesias followed by the increased dosage needed of the medication to get the same amount of relief from dyskinesias. Due to this adverse effect, ropinirole has been added to treatment plans. In the studies that were reviewed, those who used ropinirole showed an improvement in both motor and non-motor Parkinson's symptoms, while also allowing a reduction in previous levodopa dose.

Applicability to Clinical Practice

This literature review study can be helpful in clinical practice. Overall, this study can be generalized to the elderly population of those 65 years of age and older. This research provides valuable insight into the benefits of lifestyle modifications for those with prodrome Parkinson's or those previously diagnosed with Parkinson disease. Further research doe need to be conducted to make definitive recommendations, however, there is some evidence to show that physical activity and diet modifications can lead to a reduction in symptoms as well as an increase in medication efficacy.

Acknowledgements

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