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Review Article

Nutrition in Patients with Parkinson's Disease

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Abstract

The topic of nutrition in patients with Parkison's disease has been investigated over the past years. There are some known recommendations that should be preferred in these patients. This refers to nutritients that should be taken during the everyday living, as well as the nutritional habits that will help to overcome the gastrointestinal issues that these patients are facing with.

Keywords: Nutrition, Patients, Parkinson's Disease

Introduction

Parkinson's disease is one of the most common neurodegenerative disease, with a progressive course and is characterized with four cardinal motor symptoms- bradykinesia, rigidity, tremor and postural instability. Despite these motor symptoms, sooner or later, these patients experience non-motor symptoms like, behavioral problems, sleep disorders, cognitive decline etc.

This disorder has a multifactorial etiology. The new concept of pathphysiology of Parkinson's disease (PD) is related with "gastrointestinal microbiome-gut-brain axis". It is revealed that there is an important link between the gut microbiota and the central nervous system (CNS), that has an influence and is responsible for pathogenesis of neurodegenerative diseases [1]. Gut microbiotas influence the activity of enteric neurons from enteric nervous system (ENS), possibly affecting cellular alfa-synuclein secretion. Within the central nervous system, early alfa-synuclein pathology is often found in structures supplying parasympathetic innervations to the gut. Thus, the vagal nerve could be a route for spreading of alpha-synuclein-related neuropathology from the ENS to the CNS. The vagal nerve is crucial for the communication between gut microbiota and the brain [1].

Thus, maintaining the content and vitality of microbiota in the gut could be the main factor in preventing neurodegenerative diseases. Also, food habits and nutritient intake in elderly Parkinson's disease patients, for sure will have an impact of general medical condition and will postpone complications that these patients are expecting during the disease course. In the prospective study, conducted among 49,692 men and 81,676 women, and follow up of 16 years, it was found that nutrition products like whole grains, nuts, fruit, vegetables, legumes, low to moderate intake of fish and wine, low intake of red meet, saturated fat and dairy foods, may reduce the risk and protect from Parkinson's disease [2,3]. Mediterian diet, as a diet that is characterized with consumption of this kind of nutritients, is one of the specific diets that is recommended for these

patients. Adherence to these nutritients have been associated with favorable gut microbiota characteristics [3] Another dietary components have been investigated in research studies. For example, consumption of caffeine and coffee, has been associated with lower PD risk generally, especially in men. There is unclear association between tea and PD [4]. Epidemiologic studies of Parkinson's disease (PD) conducted in order to asses the distribution of the disease in various populations, have consistently found, over a few decades, that smoking cigarettes are associated with lower risk of PD. In addition, some studies reveal that an inverse relationship between smoking and PD is dose-dependent. That means if a person smokes more cigarettes, then there's is a lower risk to be affected by Parkinson's disease. But, all physicians and researchers agree that, smoking should not be recommended to patients, mainly because it is a risk factor for other diseases, like cerebrovasular and cardiovascular diseases, variety of pulmonal diseases, etc. Another fact, nicotine from tobacco has a similar molecular structure with the brain chemical acetylcholine, so it stimulates the nicotinic acetylcholine receptor (nAchR). It is known that acetylcholine has effects on the brain circuits that are responsible for developing PD. Further, it is known that nicotine and its receptors are involved in dopamine signaling and that nicotine can protect against damage of dopamine neurons in the experimental models [5]. Regarding the dietary antioxidants, such as vitamin C, vitamin E, and arytenoids, and PD risk, studies reveal that there is no clear evidence of the protective effects of these supplements [6].

On the other side, patients with Parkinson's disease are facing with some issues related with daily nutrition [7] During the disease, patients with PD may face with weight changes. Progressive weight loss due to malnutrition is a major feature of PD progression. It is believed that weight loss is a process that starts several years before the PD the diagnosis is established. In the advance stage of the disease, when the motor symptoms really affect the everyday living, the ability of nutrition is impaired. Decline in cognitive functions, may also have an impact on nutrition, in a way that it can reduce the interest of food as well as the eating habits. On the other side, some surgical procedures (pallidothomy, deep brain stimulation) or dopamine agonists such as pramipexole with compulsive eating as a side effect, might produce weight gain [8,9]. Another issue associated with nutrition are gastrointestinal complaints, like dysphagia, gastric and small intestine dysfunction, as well as constipation. These may affect the patient's well-being, treatment optimization, and nutritional balance [10]. Control of motor symptoms is mandatory in order to improve dysphagia. L-dopa and apomorphine are medications that are recommended in the early phases [11] The prokinetic agents, such as domperidone, taken by oral route, are useful in the management of delayed gastric emptying [12] But, in the treatment of constipation, prokinetics are not recommended. In this condition, stool softeners are widely used and well tolerated, while the irritant laxatives are reserved only for selected patients [13] Fiber in dose of 30 to 35g, along with optimal fluid intake, play an important role in the management of constipation and adequate consumption. The use of probiotics and prebiotics is recommended in the elderly. Physical activity with its many beneficial effects is highly recommended [14].

Another point that should be cautious about is introduction of L-dopa and the protein-redistribution dietary regimen can improve its absorption. Aminoacids and L-dopa compete for transportation in the small intestine, as well as at the blood-brain barrier, through a specific active-transport. As a result of this competition, there is am impaired absorption of the medication, and the patients will experience a suboptimal clinical response. Patients should take their therapy minimum 30 minutes before meals in order to maximize the absorption. A diet with a normal protein content (15% of total energy) is recommended to patients in the initial stages of the disease, whereas low-protein diet (10% of total energy) are more suitable in the advanced disease [15].

Patients with Parkinson's disease do experience some gastrointestinal issues, which can be managed properly. They should be introduced to a well- balanced Mediterranean-like diet model. Nutritional interventions and counseling should be organized. Regular controls and appropriate pharmacological treatment for motor and non-motor symptoms is the most important.

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