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ONSET, CHARACTERISTICS & PATIENT NEEDS OF PARKINSON'S SUFFERERS

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ABSTRACT

Parkinson's disease (PD) is a progressive neurological disorder. PD occurs when the brain's substantia nigra neurons of the basal ganglia begin to die; therefore, decreasing dopamine in the body. The onset of PD can occur at a young age, but the most common diagnosis is after 60 years old. Aging remains the biggest risk factor for developing idiopathic PD. With proper management, most individuals with Parkinson's disease can lead long, productive lives (Heyn & Davis, 2016). The typical characteristics of PD include dystonia and resting tremors, usually of the hands and progressing to the arms; additional characteristics are rigidity in the arms, legs, or neck and shuffling gait. There are 5 stages in PD as well as gene mutations that may be the cause. There are no cures, only treatment options to manage the symptoms of PD. Certain specialist are often recommended to help with the daily life challenges of PD; in addition, dental considerations such as oral pathology, dental hygiene, and prevention.

KEY-WORDS: Parkinson's disease, onset, lifestyle accommodations, oral health

INTRODUCTION

Parkinson's disease (PD) is the second most common age-related neurodegenerative disease following Alzheimer's disease. PD is more common in the elderly; however, age is not the cause. The prevalence of PD is 1.5 times greater in men than in women. 10 million people worldwide are living with PD. About 60,000 people are diagnosed with PD each year and thousands of individuals that have it do not get diagnosed. This means about 1 to 2 out of 1,000 people have PD (Reeve, Simcox, & Turnbull, 2014).

Aging remains the biggest risk factor for developing idiopathic PD; however, researchers do not know what specific age-related factors predispose some individuals to develop this common neurodegenerative disease. Trauma to the head or exposure to environmental toxins such as pesticides and herbicides may be a risk factor (Heyn & Davis, 2016). The first signs of PD can become apparent long before the disease is diagnosed; about 10% of all patients develop symptoms before age 50.

According to the American Parkinson Disease Association (2018), early-onset Parkinson's occurs when a doctor diagnoses the disease in a person 21 to 50 years old. According to the National Parkinson Foundation (2018), studies show that 65% of people with juvenile Parkinson's (diagnosed before age 20) is due to a genetic mutation. A genetic mutation affects 32% of people who are diagnosed between age 20 and 30. Late-onset PD is when a diagnosis is made after age 50. Most cases occur in people over the age of 60. It has been estimated that the incidence of PD increases with age, reaching a prevalence of 2.6% in people aged 85 to 89 years.

Researchers are actively improving the understanding of the biological mechanisms of the disease. Gene mutations are more prevalent in early-onset PD, while environmental factors may play more of a role in idiopathic PD (Parkinson's Foundation, 2018). Currently, five genes have been identified that are definitively associated with PD. SNCA (synuclein, recessive alpha non A4 component of amyloid precursor, early-onset) in brain cells of individuals with PD, the protein aggregates in clusters termed Lewy bodies. PARK2 (Parkinson's disease autosomal, juvenile), PARK7 (Parkinson's disease autosomal recessive, early-onset), PINK1 (PTEN-induced putative kinase, early-onset), LRRK2 (leucine-rich repeat kinase, late-onset). Additional chromosome regions and the genes GBA (glucosidase beta acid), SNCAIP (synuclein alpha interacting protein), and UCHL1 (ubiquitin carboxyl-terminal esterase L1) may be linked to Parkinson's disease as well (Heyn, 2017). Individuals diagnosed with early-onset PD typically have a family history of PD. However, some people with the same genes may not develop PD at all. Genetic tests are not generally available, nor are they recommended for most individuals with PD; as mutations in these genes are rare.

There are 5 stages in Parkinson's disease. In stage 1, symptoms are mild or non-existent as they do not interfere with the individual's quality of life. In stage 2, symptoms worsen, and daily activities become problematic. There is generally a lot of frustration because the person is attempting to adjust to the effects of the disease. Stage 3 is considered mid-stage PD. The individual tends to lose balance, perform slower movements and falls become frequent. Their symptoms impair daily activities such as, getting dressed, showering, eating, and brushing teeth. In stage 4, the effects of PD become severe and the individual may need assistance walking and carrying out daily activities. Stage 5 is the most advanced stage of PD. The individual may experience severe motor deficits such as stiffness in the legs, making it impossible to stand or walk. The incidence of falls in advanced PD is high (40–70%). Individuals in this stage require wheelchairs and fulltime complete care. Furthermore, 30% of individuals in stage 4 and 5 experience confusion, hallucinations, and psychosis. Dementia is also common, affecting up to 75% of people with Parkinson's (Varanese, Birnbaum, Rossi, & Rocco, 2010).

GENERAL AND TYPICAL CHARACTERISTICS OF PARKINSON'S DISEASE

PD is a progressive neurological disorder; symptoms linger and get worse over time. PD occurs when the brain's substantia nigra neurons of the basal ganglia begin to die. The cells in the substantia nigra produce the chemical dopamine, which sends signals to the brain that control movement and coordination. With the decrease in dopamine, the messages to the brain controlling movement are slowed (Senior Living, 2018).

The typical characteristics of PD include dystonia and resting tremors usually of the hands and progressing to the arms. Bradykinesia causing sluggish movements and inability to perform two movements at once. Stiffness in the arms, legs, or neck; muscles are regularly tensed and contracted. Postural instability or loss of balance and walking

problems can cause the individual to develop a forward or backward lean (Schlenstedt, et al., 2016). In addition, depression occurs in 40-70% of individuals with PD; and anxiety occurs in about 70% (Senior Living, 2018).

People with early-onset PD may not initially experience some of the symptoms associated with the disease. Symptoms of early-onset PD are, dystonia, jerking, tics, and (cramping and abnormal postures) such as arching of the foot (Ostrem & Galifianakis, 2010). Dementia typically occurs in 20-40% individuals with late-onset PD (Senior Living, 2018).

Non-motor symptoms of PD or "dopamine-non-responsive" symptoms include cognitive impairment, mood disorders, problems sleeping, and REM sleep disorder. They might also experience low blood pressure when standing, constipation, speech and swallowing problems, as well as unexplained pains, drooling and loss of smell (Gorrell, 2011).

GENERAL MEDICAL NEEDS AND SERVICES

Dental hygienists should schedule patient's with PD 60–90 mins after their medications have been taken. If a patient with PD came into the dental office for periodontal therapy accommodations need to be made. Depending on the stage of Parkinson's disease, there may or not be a caregiver present. If there is a caregiver, the dental professional would include the individual in the nutritional counseling, oral health education, and self-care regimen needs. The hygienist would recommend a power brush and a water flosser to ensure proper mechanical disruption of biofilm. The Collis Curve toothbrush would be an excellent recommendation as it enables the patient to debride all three surfaces at once (Top 12 Dental Devices, 2018). It would be beneficial to use the show-tell-do approach for the patient as well as the caregiver when introducing self-care aids. The patient with PD may be on multiple medications with adverse effects such as xerostomia and glossodynia. Providing the patient and caregiver with solutions such as fluoride and salivary substitutes would be essential in the prevention of dental caries. On the contrary, patients may also present with sialorrhea or become a mouth breather due to loss of control of orofacial muscles (Zlotnik, Balash, Korczyn, Giladi, & Gurevich, 2015). The patient may also present with frictional keratosis of the oral mucosa. As well as cheek biting, linea alba, and traumatic ulcers. The hygienist may suggest a mouth guard to prevent attrition and TMD from bruxism. In addition, dental materials are a consideration due to bruxism; for example, fabricating with auto-polymerizing high impact resin for a denture due to its high flexural strength (K.pavithra, Rhea, M.dhanraj, & P, 2018).

A patient with PD may require additional appointments due to dystonia leading to delays in time management. With informed and implied consent, the hygienist may need assistance exposing radiographs, holding the patients head and/or extremities (Hodgson, Norman, & Simmer-Beck, 2014). An additional aid such as a neck pillow may provide comfort for the patient and assist with restricting involuntary head movements.

GENERAL DAILY LIFESTYLE ACCOMMODATIONS

While there is no cure for PD at this time, there are several treatments that can ease symptoms. Many patients with PD are on a cocktail of medications to help with motor symptoms. These medications are adjusted accordioning to the individual's case. Levodopa remains the most effective symptomatic therapy. It is often used in combination with dopamine agonists, COMT Inhibitors, MAO Inhibitors, and anticholinergic agents.

The surgical option that has been approved by the FDA for over a decade is deep brain stimulation (DBS). DBS involves inserting an electrode into the brain, typically the subthalamic nucleus (STN) or the globus pallidus interna (GPI). The implantation in the brain can be done on unilaterally or bilaterally as needed. The electrodes are stimulated through a connection to a neurostimulator (pacemaker-like device) placed beneath the skin in the chest to aid in the control of electrical impulses affecting movement and flexibility. Stimulators are replaced roughly every 3-5 years. To be a candidate for this surgery, the patient must have a healthy response to Levodopa, no substantial psychiatric complications, and no problems with balance (Williams, Foote, & Okun, 2014).

There is a prototype that was designed by students at Imperial College in London. It is called GyroGlove, and it designed specifically for individuals with PD. The technology uses gyroscopes to resist a person's hand movement, thus dampening any tremors. Conserving angular momentum to stay upright in any plane of motion, they are therefore able to counter any input of force in any direction swiftly and proportionately. Although this glove has yet to be released it shows great promise and could have a significant impact on quality of life (Parkin, 2016).

The number of lifestyle accommodations that come with PD varies. Since PD presents differently in everyone, it is important to have a well-rounded team of specialist. Physical, occupational and speech therapists can be important cohorts in the treatment of PD. Physical therapy can improve gait and assist in a workout regimen. Occupational therapy can aid in maximizing fine motor skills. As well as incorporating devices such as manipulated utensils, a grab stick and grab bars. Speech therapy can be useful to address speech changes with PD. The additional specialist that may support the patient with PD are, the primary care provider, movement disorder specialist, nutritionist, psychologist, neuropsychologist, and social worker. In addition, the caregiver plays a very significant role (Pedersen, et al., 2017). If the patient with PD needs full-time assistance the caregiver may be feeding the patient so proper nutritional counseling is essential. The caregiver may be driving the patient, so they may need to be educated on proper wheelchair transfers. The patient with PD may be suffering from anxiety and depression so a caregiver with uplifting spirits would be ideal.

CONCLUSION

In my opinion, providing a standard of care may be challenging but it is possible with minor adjustments to the norm. I think patients with PD would have a difficult time knowing they can't control their movements during treatment. It would be important to me to reassure the patient that I understand, and it is perfectly fine. I can imagine their anxiety levels would be higher than usual, so I would want to comfort them in any way I could. I would treat them with the same respect as anyone else; meaning, I would not treat them as if they were special needs. I would give the patient, and/or their caregiver written instructions for self-care and nutritional recommendations. I would make sure they felt comfortable around me as a clinician because I feel that is important. People with Parkinson's disease are still people with, concerns, fears, and potentially an active sense of humor. I have to say I was fascinated doing research for this paper. I was unaware of DBS surgery and I watched several of them on YouTube. What neurosurgeons can do completely blows my mind. I was also amazed by the GyroGlove prototype; although it is not currently released, it will be shortly. In my opinion, the GyroGlove is genius mostly because it is non-invasive, and I think it would benefit patients with PD. It would steady their tremors and they would be able to brush and floss their teeth and perform other daily routines that require a steady hand.

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