

Prosthodontic Management in Parkinson's disease - A Review

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ABSTRACT

Parkinson's disease is neurological disorder characterized by rigidity, tremors, postural instability and bradykinesia. Parkinson's disease is seen in about 6.3 million people of all races and culture. Impaired motor skills and cognition effects the diet of patient, nutrition and therefore compromises the general health and oral hygiene of the patient. As a result dental caries, Periodontitis and finally edentulism is commonly seen. Diligent handling with "Tender, Love and care" are required for treating such patients. The family of the patient should also be educated about the disease. This article reviews the etiology, clinical features, orofacial findings and the prosthodontic management of such patients.

Keywords: Paralysis, Xerostomia, Over Denture, Implants

I. INTRODUCTION

Parkinson's disease also called as paralysis agitans first described by Dr. James Parkinson in 1817. It is a progressive neurodegenerative disorder effecting muscle control, movement, balance and many other non-motor functions. It is also called Shaking palsy. Parkinson's disease is the most common movement disorder and the second most common neurodegenerative disorder¹. The depletion of neurotransmitters, nor epinephrine and dopamine in the basal ganglion results in the Parkinson's disease^{2,3}.

II. METHODS AND MATERIAL

EPIDEMIOLOGY

Parkinson's disease occurs most commonly at the age of 50-60 years, but can also be seen in middle age group. The prevalence in general population is 0.1% but in persons above 65 years of age is 1%. In Canada about 100,000 people suffer from Parkinson's disease. In US

about 1.5 million people suffer from Parkinson's disease as reported by National Institute of Neurological Disorder and Stroke (NINDS), in which the percentage for the age group above 60 years is 1-2% while as for the age group above 85 years is 3-5%. Annually about 50,000 new cases of Parkinson's disease are diagnosed in US. It is more prevalent in Caucasians than that of Oriental Asian ancestry or black Africans. Men are affected twice as compared to that of women. Few authors have also suggested the role of genetic and chemical exposure in minority of cases.¹⁻⁵

ETIOLOGY

The two major factors considered by the Parkinson's disease foundation to be the causes of Parkinson's disease are genetic and environment factors. Ciarrocia et al⁶ in 2003 suggested that Parkinson's disease may be due to the combined effects of genetic predispositions, accelerated aging, head injuries, exposure to neurotoxins or pesticides or an abnormal oxidative mechanism. Parkinson's disease is also seen in

the persons with the occupation of welding, cleaning or farming. Drinking water containing more concentration of heavy metals like mercury, Iron, Zinc, and Manganese can also increase the incidence of Parkinson's disease.

CLINICAL FEATURES

Parkinson's disease is gradual in onset and is unilateral initially. Early signs of disease are mild stiffness and resting tremors. "Pill-rolling" movement between thumb and fingers is the typical feature of Parkinson's disease. The tremors then spread to mandible, tongue, legs and face. Allen and Leuck described the flexed posture of these patients due to rigidity. These patients are also unable to initiate voluntary and involuntary movements, this is called as Akinesia⁷. These patients exhibit a different gait which is often slow and shuffling with stooped posture. These patients tend to walk with shorter steps at fast speed. Autonomic dysfunctions were seen in such patients which include varied Blood Pressure, Bladder and Bowel dysfunction and excessive sweating⁸.

OROFACIAL FEATURES

These patients exhibit a typical "Mask like" appearance due to the reduced movements of facial muscles. Other symptoms include lip pursing and tongue thrusting. There is a change in voice which becomes soft which is barely audible due to rigidity. These patients take more time to consume food due to reduced tongue movement, slow chewing movement and dysphagia. Medication alters the taste perception of the patient. Saliva drools from the corners of mouth which leads to angular cheilitis, fetid odor and skin irritation. Choking can result due to the accumulation of food and saliva at the back of tongue. Orofacial muscle tremors and Levodopa medication can lead to bruxism, attrition and some cracked tooth⁸. Xerostomia is another symptom of Parkinson's disease which is due to the medication used in Parkinson's disease like anticholinergics, Levodopa and dopaminergics. 25% of Parkinson patient's exhibit Burning mouth syndrome. Symptoms like burning sensation of hard palate, tongue, cheeks, lips, floor of mouth and edentulous alveolar ridge is almost noted in all the patients whether the patient is dentate, edentulous or denture wearer⁹.

PROSTHODONTIC MANAGEMENT

Physician consultation should be taken for any modification in the treatment plan before starting dental treatment. Written consent should be taken from the patient or caregiver. Early morning appointments should be given for such patients as the symptoms are least bothersome for 60 to 90 minutes after taking the medicine. Duration of the appointment should be less than 45 minutes. Patient should empty bladder to prevent incontinence and urinary urgency. Patient should be kept in upright sitting position to avoid orthostatic hypotension. Such patients can show anxiety or frustration behavior, this can be avoided by using relaxation and diversion methods¹⁰. Sometimes the dentist need to identify himself each time, use short sentences, simple words and avoid wearing face mask. Direct eye contact, smiling and gentle touch can help. To reduce the anxiety the caregiver of the patient should be allowed to sit next to the patient¹¹. Since such patients are unable to keep their mouth wide open for long time, drooling of saliva occurs and also the tongue and head movement can interfere with the treatment procedure. An intraoral rubber bite block or extra oral ratchet type prop should be used to keep the mouth of the patient open for the convenience of the procedure. 45 degree inclined chair position should be preferred to facilitate the patients swallowing. Saliva should be aspirated regularly using aspirating tip under the rubber dam¹². Because of the impaired manual dexterity the oral hygiene maintenance of such patients is compromised. Oral hygiene maintenance such as regular use of tooth brush, flossing method and fluoride application should be advised for the patient and also the caregiver of the patient should be advised for the same.⁸

Removable Prosthodontics

Due to the drooling of saliva, tremors and rigidity of orofacial musculature it is difficult for the patient to control and retain the prosthesis. In such patients the retention, stability and support of the prosthesis is always compromised. Quick setting impression materials should be used to record the impression especially in severe cases. Wax and compound should be used to record Jaw relations after properly training the patient. Flange technique and Neutral zone techniques should be used, and monoplane occlusion is preferred for maximum inter cuspsation to avoid

interferences¹³. These techniques also improve the stability and retention of the denture. Turner et al¹⁴ advised the use of artificial salivary substitutes and moisture based denture bases for severe xerostomic patients. Metal denture bases or high impact denture base resins are preferred. Denture cleansers should be prescribed and patients oral and denture hygiene should be properly inspected¹⁵.

Fixed Prosthodontics

Supra gingival or equi gingival margin of the preparations are preferred. For maximum retention and resistance form full coverage restorations should be given. The use of rubber dam and suction aids is compulsory especially when there is drooling of saliva. Al Hamad et al¹⁶ in 2008 suggested that the retraction of gingival sulcus should be done using an expanding Vinyl polysiloxane. Over contouring of the prosthesis should be avoided as it may cause plaque accumulation resulting in gingival hyperplasia. Resin fused to metal or gold bridges should be used in the patients with bruxism. The retainers and the pontic of the prosthesis should be designed for being self cleansing. Fixed partial dentures should be cemented using resin cements as it reduces microleakage.

Implant Surgeries

The use of implant supported prosthesis has greatly improved the general as well as oral health of the patient; masticatory ability of the patient is also improved with the use of such prosthesis^{17,18}. Use of magnetic attachments in the mandibular over dentures is very helpful to the patient as it is easy to insert and remove for the patient¹⁹.

III. CONCLUSION

As discussed earlier Parkinsonism is a degenerative disorder effecting muscles of face, pharynx, tongue and palate. Such patients can be very difficult to treat due to their behavioral or psychological pattern which is associated with the disease. Careful approach with diligent handling of the patient during the treatment results in the success of the prosthesis. Patient education and motivation about the post insertion instructions helps in the long term success of the treatment.

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