

Sialorrhea in patients with Parkinson's disease: A case report

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ABSTRACT

Introduction: Sialorrhea is a common disorder in neurodegenerative diseases, being one of the most frequent signs resulting from the progress of Parkinson's disease (PD). It consists of the excessive production of saliva and its accumulation in the oral cavity and oropharynx, compromising the quality of life and health and increasing the development of diseases.

Case Report: A 66-year-old female patient, diagnosed with Parkinson's disease 13 years ago, complained of hypersalivation and xerostomia, with consequent depletion of her quality of life, and underwent botulinum toxin application to the parotid glands and radiotherapy irradiation of the submandibular glands and 2/3 of the parotids, as well as physiotherapeutic and speech therapy intervention.

Conclusion: Considering the high incidence and prevalence of sialorrhea in patients with Parkinson's disease, the methods of treatment and rehabilitation available in order to re-establish the patients' well-being will be discussed. The negative implications generated by sialorrhea on the quality of life and health of patients with PD are evident, which justifies the present study and its approaches within the field of treatments and interventions for the rehabilitation of these patients.

Keywords: Parkinson disease, Rehabilitation, Sialorrhea

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INTRODUCTION

Parkinson's disease (PD) is a neurodegenerative disorder that affects 1–2 individuals in 1000 inhabitants and incurs motor and non-motor symptoms that evolve with disease progression, especially in the senescence period [1–3]. Among the non-motor symptoms of Parkinson's disease, sialorrhea, a condition characterized by excessive saliva production combined with bradykinesia of the muscles involved in the swallowing process, leading to accumulation in the oropharynx, is a common disorder that affects 30–80% of patients [4, 5].

The occurrence of sialorrhea may be associated, among other factors, with a neuromuscular disorder, an inability of the muscles involved in the tongue and swallowing reflexes, neurosensory alterations, and even hyperactivity of the salivary glands [4, 6–8]. The clinical condition promotes a decrease in the quality of life and health of the patient with PD, favoring the development of diseases such as alterations in the oral microflora, a greater propensity to caries and bronchoaspiration pneumonia, as well as a decrease in the psychosocial capacity of the individual [4, 5, 9].

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Given the above, different approaches are outlined for treatment and rehabilitation of patients with sialorrhea, aiming to ensure better quality of life and health parameters. To this end, less invasive protocols are used, such as pharmacological, physiotherapeutic, and speech therapy, as well as more invasive ones, such as the application of botulinum toxin and radiotherapy in small doses in the salivary glands, and may even include surgical procedures [8–10].

Therefore, this paper aims to discuss the clinical case of a patient known to have Parkinson's disease and who presents, among other symptoms, sialorrhea. Furthermore, the study intends to highlight and bring to discussion the treatment and rehabilitation protocols instituted for this condition.

CASE REPORT

CMA, a 66-year-old female, has had Parkinson's disease for 13 years. During her last visit on 06/05/2021 she complained of depletion of her quality of life and discomfort with the amount of salivation and xerostomia. The hypersalivation generated significant social and psychological impairment; causing her to avoid going to places that used to be pleasant and to start treatment with antidepressants. Treatment with oral medications (amitriptyline, atropine, mirtazapine) was tried, without results. Later, 150 U botulinum toxin was applied, guided by ultrasonography in each parotid; however, there was only a partial reduction of the symptom, during two months. The patient questioned about radiotherapy evaluation; proposal not known by our group. In a specific service in São Paulo (Brazil), the patient underwent irradiation of the submandibular glands and two-thirds of the parotids at a dose of 19 Gy in 05 fractions in the period from 07/02/2021 to 07/07/21. In the penultimate treatment application, the patient already indicated a significant improvement in sialorrhea; this was maintained until the last return to our private clinic, three months after the end of the 10/2021 irradiation.

DISCUSSION

Sialorrhea is a condition of hypersalivation, with high incidence and prevalence in neurodegenerative diseases such as Parkinson's disease. Caused by the patient's inability to control secretion in the salivary glands, combined with bradykinesia and paresis of the muscles responsible for the swallowing process, as well as possible neuromuscular and neurosensory alterations, resulting in fluid accumulation at the bottom of the vestibule [4, 5, 9, 11].

The salivary glands initiate the process of saliva production through the stimulus generated by dopamine in muscarinic receptors. It is known that, at the beginning

of the disease, it is common to occur depletion of saliva production due to the dopamine deficit. This is associated to the fact that levodopa triggers the development of hypersalivation [4, 5].

The production of saliva under normal conditions occurs in average 0.3 mL/min, and may reach 7 mL/min when there is stimulus, a time that has a greater action of the parotid glands and regular production of the submandibular and sublingual glands, the latter being responsible for a tiny amount in relation to the others [5].

Sialorrhea, in this sense, can cause several problems, since, combined with other PD symptoms, it causes an attenuation of the ability to perform oral hygiene properly, leading to a greater propensity to develop caries and oral microflora changes. Furthermore, the accumulation of saliva in the oropharynx can result in bronchoaspiration pneumonia, a condition responsible for about 20% of deaths in patients with Parkinson's disease [4, 7].

The influence of hypersalivation on the quality of life of patients is still questionable. Some studies state that there is a lower capacity for social interaction and a higher incidence of depression and anxiety [4, 5]. While others question whether such a correlation is true [12].

From the rehabilitation point of view, sialorrhea has different approaches, some of them less invasive and more conservative, such as the use of oral medications and dental, physical therapy and speech therapy interventions [4, 5]. Others, more invasive, such as the application of botulinum toxin and small doses of radiotherapy to the salivary glands [13, 14].

We highlight the use of oral medications, one of the less invasive approaches for the treatment of sialorrhea, capable of acting on the inhibition of muscarinic receptors, in order to decrease the flow of saliva. Among the drugs, we highlight amitriptyline, atropine, scopolamine, glycopyrrolate, ipratropium bromide, and mirtazapine [9, 15]. It is worth mentioning that the drugs used are not specific for the treatment of sialorrhea, and may incur in several side effects and not present the expected results [9].

Also, as instituted to the treatment of the patient studied by us, among the less invasive approaches are the rehabilitation protocols used for the treatment of sialorrhea through speech therapy and physical therapy that act, respectively, for the stimulation of the swallowing reflex and stimulation of facial muscles, increasing the capacity and range of movements, which promotes an improvement in the condition and, consequently, in the patient's quality of life [4, 5, 9, 16].

The botulinum toxin application protocol (incobotulinumtoxinA and rimabotulinumtoxinB) in the salivary glands, especially in the parotid and submandibular glands, is one of the most effective protocols, with good immediate and long-term results. Such conduct was instituted for the patient in question [4, 12, 17–20]. This procedure can be done through anatomical points or ultrasonography, and the latter, used in the patient, has a higher rate of effectiveness,

ranging from 79% with anatomical guidance to 96% with ultrasonography guidance in the parotid glands, and 50% with anatomical guidance to 91% with ultrasonography guidance in the submandibular glands [4].

The use of radiotherapy in small doses in the salivary glands for inhibition of muscarinic receptors and consequent decrease in salivary flow, also applied to the case under analysis, shows, in the same way as botulinum toxin, a positive and prolonged effect [6, 9, 14]. However, due to the possible side effects (development of neoplasms), a careful evaluation of the risks versus the benefits is necessary when choosing this route of treatment, even if these occur in low frequency [9, 14].

Finally, surgical procedures for the treatment of sialorrhea, based essentially on the removal of the salivary glands or the ligation or relocation of the ducts that conduct salivary secretion, are the most invasive and non-reversible method, not being commonly used and only considered for elderly patients after the failure of non-surgical procedures [9, 21, 22].

CONCLUSION

In view of the above, sialorrhea is a common symptom in patients with Parkinson's disease, allowing the development of aggravations and a decrease in the psychosocial capacity of the patient. In this aspect, there are several lines of treatment to be applied according to the profile of each patient, and for this, the responsiveness and the risk-benefit ratio is observed, in order to re-establish the quality of life and health.

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Author Contributions

Marco Orsini – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Isabella Paglione Pedrozo – Conception of the work, Design of the work, Interpretation of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Anna Luiza Guimarães Rosa – Design of the work, Acquisition of data, Analysis of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Antonio Marcos da Silva Catharino – Conception of the work, Design of the work, Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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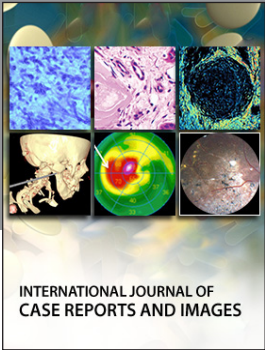
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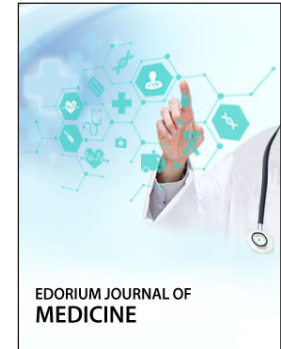
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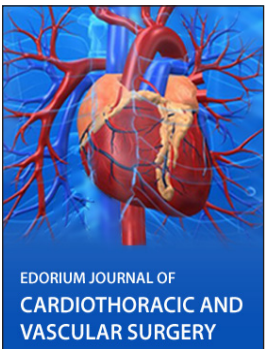
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