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THE IMPACT OF DENTAL TREATMENT ON ORAL MICROBIOTA OF A PATIENT WITH SJÖGREN'S DISEASE: A CLINICAL CASE REPORT

O IMPACTO DO TRATAMENTO ODONTOLÓGICO NA MICROBIOTA ORAL DE PACIENTE COM DOENÇA DE SJÖGREN: UM RELATO DE CASO

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RESUMO

A Doença de Sjögren (SD) é uma desordem sistêmica crônica autoimune caracterizada por infiltração de linfócitos nas glândulas exócrinas, atingindo principalmente as glândulas lacrimais e salivares, sendo a xeroftalmia e a xerostomia os sintomas mais prevalentes. A xerostomia provoca mudanças na microbiota oral, podendo levar a quadros de disbiose e ao desenvolvimento de desordens orais. Este trabalho relata o caso clínico de uma paciente do sexo feminino, 38 anos, que procurou tratamento odontológico devido à insatisfação com a estética do sorriso. Durante a anamnese, relatou diagnóstico prévio de SD. Foi realizada sialometria estimulada para avaliar o fluxo salivar, com média de 0,1 ml/min de saliva produzida. Com o intuito de avaliar a alteração da microbiota dessa paciente ao longo do tratamento, uma amostra de saliva foi diluída e cultivada em placas contendo CHROMagar Candida, no início do tratamento e ao final dos tratamentos de adequação do meio bucal. Observou-se alteração das espécies prevalentes no início e ao final das intervenções odontológicas. Corroborando com dados que demonstram que tratamentos odontológicos para promoção e adequação do meio bucal em pacientes com SD, sem o uso de agentes antimicrobianos, podem provocar mudanças na microbiota oral desfazendo quadros disbióticos.

PALAVRAS-CHAVE: Doença de Sjögren; Candida; Disbiose.

ABSTRACT

Sjögren's Disease (SD) is a chronic systemic autoimmune disorder characterized by lymphocytic infiltration of exocrine glands, primarily affecting the lacrimal and salivary glands, with xerophthalmia and xerostomia being the most prevalent symptoms. Xerostomia leads to changes in the oral microbiota, potentially resulting in dysbiosis and the development of oral disorders. A 38-year-old female patient sought dental treatment due to dissatisfaction with the aesthetics of her smile. During the anamnesis, she reported a previous diagnosis of SD. Stimulated sialometry was performed to stimulate salivary flow, with an average of 0.1 ml/min of saliva produced. To evaluate changes in the patient's microbiota throughout treatment, a saliva sample was diluted and cultured on CHROMagar Candida plates at the beginning and the end of the oral environment adjustment treatments. A shift in the prevalent species was observed between the initial and final stages of dental interventions. These findings support that dental treatments for stabilizing the oral environment in SD patients, even without antimicrobial agents, can lead to changes in the oral microbiota, reversing dysbiotic conditions.

KEYWORDS: Sjogren's Disease; Candida; Dysbiosis.

INTRODUCTION

Sjögren's Disease (SD) is a chronic systemic autoimmune disorder characterized by lymphocytic infiltration of the exocrine glands. It primarily affects the lacrimal and salivary glands, with the main symptoms being xerophthalmia and xerostomia.[1,2] The decrease of salivary flow could contribute to changes in the oral microbiota, promoting dysbiosis, promoting oral unhealthy conditions, such as caries, endodontic infections, and periodontal diseases, in addition to the systemic condition of the host, including chronic or immunocompromised diseases.[3,4]

Candida spp. are commensal microorganisms of the oral microbiota. Studies on the interaction between this fungus, the host, and other oral microorganisms show promise for supporting the development of novel drugs and therapeutics while reducing the risk of disease, particularly in immunocompromised patients.[3,5,6] Stabilizing the oral environment is the first step in dental treatment. It involves procedures tailored to patients' needs and aims to prevent the progression and development of oral diseases or conditions.[5,7,8] This short case report of a patient with SD highlights the alterations in oral microbiota observed before and after oral environment stabilization procedures.

Case report

This case report was approved by the Research Ethics Committee of Pedro Ernesto Hospital (CAAE: 18260619.0.0000.5259). The present case reports a Sjögren Disease patient who attended the Dental School of the Rio de Janeiro State University.

A 38-year-old white, non-smoking female patient, with a 6-year history associated Sjögren's Disease under treatment at another health center (Clementino Fraga Filho University Hospital), was referred for dental treatment at the extension clinic of the Faculty of Dentistry of the Universidade do Estado do Rio de Janeiro. Her medical history also included rheumatoid arthritis, fibromyalgia, hypothyroidism, and otosclerosis.

Intraoral examination revealed multiple caries lesions, dental necrosis, and needing prosthetic rehabilitation. The Decayed, Missing, and Filled Teeth (DMFT) index was assessed, yielding results of 75% and 57.14% when excluding third molars; both values fall within the category "very high" (defined as ≥6.6%). The patient presented with eight missing teeth (teeth 17, 18, 28, 36, 38, 45, 46, and 48), four restored teeth (teeth 21, 23, 33, and 43), and twelve carious teeth (teeth 11, 12, 15, 22, 25, 27, 31, 32, 37, 41, 42, and 47). All restored elements were found to have restorations classified as inadequate. The salivary flux and microbiological analysis were done.

The procedures were performed with the greatest urgency to adjust the oral environment properly. The procedure started with periodontal treatments, removing and restoring the cavities, followed by the necessary endodontic therapies, and finally, prosthetic rehabilitations were performed.

An unstimulated sialometry was performed due to the diagnosis of Sjogren's Disease, using the spitting method. The patient was instructed not to eat or drink for 30 minutes before the test. While seated at rest, she was asked to swallow all saliva from her oral cavity, lean her head forward, and spit into a graduated container for five minutes. The collected saliva was then measured using a graduated syringe, and values were converted to mL/minute. The result showed a mean saliva flow of 0.1 mL/minute. The saliva was slightly turbid

(indicating no excess of epithelial cells) and highly viscous, with abundant mucin causing foam formation in the saliva, which prevented the manipulation.

Stimulated sialometry was also performed. After swallowing all the saliva in her oral cavity, the patient chewed a paraffin device (sialogogue) to stimulate salivary secretion. For 5 minutes, all the saliva produced was deposited into a graduated container. The result was similar to the unstimulated test, with a main flow of 0.1 ml/minute; however, the stimulated saliva can be used for microbiological analyses due to its lower viscosity.

The microbiological analyses were performed at the beginning and the end of the treatment. From the collected saliva, 100µL was removed and diluted in 900µL of saline solution (NaCl 0,9%). The material in the microcentrifuge tube was homogenized and dispensed onto a culture plate containing CHROMagar Candida medium. The plate was incubated at 37°C for 48 hours. The results obtained showed a predominance of colonies with bright white coloration and bluish colonies (Figure 1,A), which can be associated with the species *Nakaseomyces glabrata* and *Candida tropicalis*, respectively, with an approximate count of $3.8x10^5$ CFU/mL. Despite the significant number of *Candida* species evaluated, the patient was not diagnosed with candidiasis or any condition related to *Candida* infection.

All procedures for optimizing the oral environment, such as periodontal treatments, removal of decayed tissues, and replacement of deficient dental restorations and endodontic treatments, were performed. The microbiological analysis at the end of the treatment shows a change in the microbiota, with a predominance of large, bright green apple-colored colonies and colonies with purple centers (Figure 1,B), which are associated with the species *Candida albicans* and *Pichia kudriavzevii*, respectively, with an approximate count of $4.2x10^5$ CFU/mL.

DISCUSSION

Sjögren's Disease (SD) is a systemic autoimmune disorder marked by T-cell-induced hyperactivation of B-cells and increased cytokine production, being glandular dysfunction being a key feature of the disease. Dry mouth and dry eyes are the primary symptoms.[1,2] The saliva has numerous functions related to the maintenance of oral integrity. It is fundamental for the first line of oral defense, such as protection through the lubrication of the mouth, oropharynx, and esophagus by the action of glycoproteins and water, antifungal action from the presence of histatin, chromogranin A, and immunoglobulins, among many other functions. Hyposalivation can cause physical, functional, and social harm, negatively impacting the patient's health.[6,9] The reduction of salivary flow makes the patient more susceptible to the development of cavities and periodontal disease and dental treatment challenges.[10,11]

The patient's classification within the "very high" category of the DMFT index is significantly influenced by salivary gland dysfunction.[12] Saliva exerts a protective effect against the development of oral damage conditions through its buffering systems, which regulate the pH of the oral environment, maintaining it within a physiologically favorable range.[6,9] This buffering capacity is essential in preventing the demineralization of dental hard tissues and, consequently, the onset of carious lesions.[9] In this context, hyposalivation played a direct role in the patient's clinical condition, as the reduced salivary flow impaired the effectiveness of the saliva's natural buffering capacity.

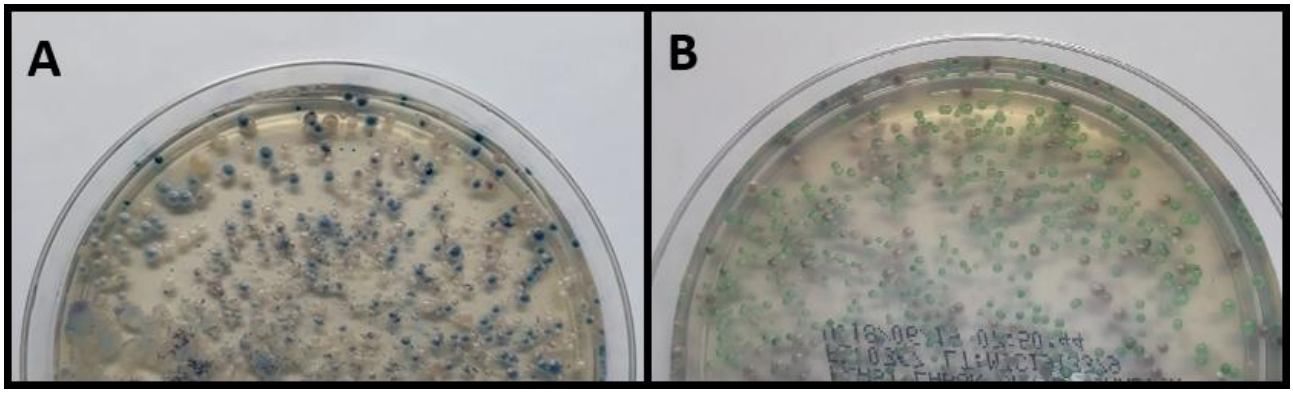
The yeast genus *Candida* is considered a commensal microorganism of different human microbiotas, including the oral microbiota. Due to the increased use of molecular

identification techniques, some species have been reclassified, *Candida glabraa* and *Candida krusei,* which were reclassified into *Nakaseomyces glabrata* and *Pichia kudriavzevii*, respectively.[13] The *Candida spp.* colonization, high incidence in the oral environment, and clinical manifestations of candidiasis in SS patients are associated with lower salivary flow and changes in salivary components caused by glandular dysfunction.[14] The *C. albicans* is the most frequent species in both SS patients and healthy individuals, followed by a high incidence of emerging species such as *C. tropicalis*, *N. glabrata*, *C. parapsilosis*, and *P. kudriavzevii*.[14]

Although C. *albicans* has been considered a commensal microorganism of the oral microbiota in SD patients.[15] Other species, such as *C. tropicalis*, *N. glabrata*, *C. parapsilosis*, and *P. kudriavzevii* can appear as harmless colonizers or potential local and systemic pathogens.[3] Non-albicans Candida, and particularly *C. tropicalis*, appear to influence biofilm formation and increase its cariogenic potential.[16] Therefore, the change in the fungal profile could reduce the risk of developing new carious lesions. The findings reinforce the necessity and importance of such interventions in controlling the oral microbiota.

Few studies compared the *Candida spp.* profile in patients with Sjögren's Disease before and after optimizing the oral environment. This report shows that a change in the candida species in the patient's oral microbiota was observed. The potential to reverse dysbiosis or changes in the microbiota through early clinical interventions is crucial for maintaining an anti-inflammatory environment that helps prevent the development of oral diseases.[5,7,8] The increased incidence of *Candida albicans* suggests a reversal of the dysbiotic state of the microbiota to a state of health. The findings reinforce the necessity and importance of such interventions in controlling the oral microbiota

Figure 1 – Evaluation of *Candida* species using CHROMagar Candida culture medium



Source: The author.

CONCLUSION

The case indicates that optimizing the oral environment through prevention, promotion, and restoration of oral health procedures resulted in a change in the oral microbiota for lower pathogenic microorganisms without the need for antimicrobial agents. The findings in this case may contribute to clinical management and guidance, suggesting that the proper adjustment of the oral environment could be key to maintaining a non-pathogenic microbiota and overall oral health.

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