



Prevalence of Prosthetic Stomatitis and Risk Factors in a Sample of Institutionalized Elderly

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ABSTRACT

Background: Prosthetic stomatitis is a medical term used to describe inflammatory changes in the response of the oral mucosa to a prosthesis. This pathology is characterized by erythema and is located below the partial or total prosthesis, both in the maxilla and in the mandible. The main causes of this pathology may be related with poor oral hygiene, non-rest of the prosthesis and local or systemic immunodeficiencies.

Objective: Determination of the prevalence of prosthetic stomatitis and causal factors in a sample of institutionalized elderly with removable prosthesis.

Methods: A cross-sectional study was designed in which the participants are institutionalized elderly in different nursing homes of the city of Viseu, Portugal. Participants were institutionalized elderly in different nursing homes with removable prosthesis. A final sample of 36 elderly subjects was obtained. There is one group diagnosed with prosthetic stomatitis and one group that does not have this condition. Clinical examination was performed and a questionnaire was applied in order to study risk factors associated with prosthetic stomatitis.

Results: It was verified that of the 36 elderly, 50% had prosthetic stomatitis and the remaining 50% did not present the pathology. Of these 36 elderly, 38.9% refer cleaning their prosthesis at least twice a day. Of the same sample of 36 elderly, only 38.9% would remove their prosthesis during night (while sleeping). Of the patients with prosthetic stomatitis, 33.3% refer cleaning their prosthesis at least twice a day and 11.1% would remove their prosthesis during night (while sleeping). Of the 18 patients without prosthetic stomatitis, 66.7% refer cleaning their prosthesis at least twice a day, and 66.7% would remove their prosthesis during night (while sleeping).

Conclusion: To prevent the extension of these lesions, prosthesis wearers should be regularly called for a clinical examination of the oral cavity and prosthesis. Preventive measures should be taken against the colonization of *Candida albicans* in the palatal mucosa and the prosthesis, such as improvement of oral and prosthetic hygiene and prosthetic removable at night during sleep. Further studies and an increase of the sample of institutionalized elderly are needed to analyze other risk factors associated with the pathology.

Key words: Prosthetic stomatitis, Prosthesis, Elderly, Prevalence, Risk factors

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INTRODUCTION

Prosthetic stomatitis is a medical condition described as inflammatory changes in the response of the oral mucosa to the prosthesis. This pathology is characterized by erythema and is located under the partial or total prosthesis, both in the maxilla and in the mandible, although it is more frequent in the maxilla [1].

These lesions of the oral mucosa can represent acute or chronic reactions to the bacterial plaque, a reaction to the material of the prosthesis or to a mechanical injury caused by the prosthesis [2]. Acute reactions include traumatic ulcers, allergic reactions to prosthetic materials, especially acrylic prosthesis, or acute infections [1,2]. Chronic reactions include prosthetic stomatitis, caused by chronic infection or trauma [1]. Traumatic ulcers caused by overextended or unbalanced prosthesis are seen in 5% of prosthetic patients [1,2].

The causes of this pathology can be related to the prosthesis or to the patient, with poor oral hygiene, non-resting of the prosthesis and local or systemic immune deficiencies [1].

Prosthetic stomatitis is the most common condition that affects the palatal mucosa in 50% of patients with partial or removable dental prosthesis [2,3]. Most injuries are caused by chronic infections, caused by *Candida albicans* [1].

Changes in microbial flora, in cases of prosthetic stomatitis, suggest that bacteria are an important factor in the development of pathology. Poor oral hygiene is linked to a greater accumulation of bacterial plaque and, thus, prosthetic stomatitis [3,4]. Patients with immunosuppression are more often subject to *Candida albicans* infections and prosthetic stomatitis (Figure 1). This clinical picture includes patients undergoing prolonged treatment with antibiotics, corticosteroids or immunosuppressive drugs [1,2-4]. In these patients, it is even more important to perform a more strict oral control, since oral infection by *Candida* can spread, systemically, and cause complex complications [1,4,5]. The objective of this study consists in the determination of the prevalence of prosthetic stomatitis and causal factors in a sample of institutionalized elderly with removable prosthesis.

PARTICIPANTS AND METHODS

A cross-sectional study was designed in which the participants are institutionalized elderly in different nursing homes of the city of Viseu, Portugal. There is a group in which prosthetic stomatitis was diagnosed and a group that does not have this pathology. The sample consisted of 36 institutionalized elderly people with partial or total removable upper prosthesis.

Clinical intraoral examination was performed by the authors of the present study, which were calibrated in order to that there was no influential bias in the final study results. Additionally, a questionnaire was applied in order to study which risk factors are the most predisposing to prosthetic stomatitis. The main variables studied, which can potentially favour the appearance of prosthetic stomatitis are the following: Non-objective symptoms



Figure 1: Removable dentures are worn by 20% of the UK population and two thirds of these individuals have denture stomatitis. Poor oral hygiene is common place among this group, as is smoking and xerostomia, which also contribute to the development of denture stomatitis. A complex polymicrobial biofilm is able to proliferate on the surface of denture materials and matures to form visible denture plaque. This denture plaque biofilm stimulates a local inflammatory process that is detectable clinically as erythema, and hyperplasia.

of the oral cavity (pain, burning mouth sensation and dryness in the mouth), oral hygiene habits and prosthetic hygiene; the duration of the use of the prosthesis, if it is removed during the night; mechanical injuries caused by the unsuitability of the prosthesis; mucosal infections, presence of bacterial plaque, conditions and stability of the prosthesis; physical activity, smoking habits, eating habits and alcohol consumption.

RESULTS

Of the 36 elderly, 18(50%) had prosthetic stomatitis and the remaining 18(50%) did not have the clinical pathology. Of these 36 elderly, 14(38.9%) performed prosthetic hygiene at least twice a day. From the same sample of 36 elderly, only 14(38.9%) removed the prosthesis at night.

Of the 18(50%) patients without prosthetic stomatitis, 12(66.7%) performed prosthesis hygiene at least twice a day and 12(66.7%) took the prosthesis at night.

Of the 18(50%) patients with prosthetic stomatitis, 6(33.3%) performed prosthesis hygiene at least twice a day and only 2(11.1%) removed the prosthesis at night.

Regarding the methods of cleaning the prosthesis, 12(33.3%) elderly people only use water to wash and remove debris and 24(66.7%) elderly people use a brush and proper toothpaste.

In terms of the time of use of the current prosthesis, 6 elderly have their prosthesis for less than 5 years, while the remaining 30 elderly have had their prosthesis for more than 5 years. The maximum usage time was 50 years.

Regarding the last visit to the dentist, 6 elderly had a dental appointment in the last year, while the remaining 30 elderly have not been to the dentist for at least one year.

DISCUSSION

In this sample of elderly studied, the fact of not removing the prosthesis at night is one of the etiological factors of prosthetic stomatitis. This pathology is one of the most frequent in patients with prosthesis, requiring the implementation of oral hygiene strategies among the nursing homes and their caregivers. According to this study, it can be hypothesized that cleaning prosthesis with soap and water is more effective in eliminating biofilm, than cleaning with water alone. It is known that the bacterial plaque irritates the mucous membranes of the oral cavity, making it a "fertile ground" for microorganisms, causing prosthetic stomatitis. Regarding the prophylaxis of mucous infections, it is essential that patients use removable prosthetic devices and that they are made of acrylic, in addition to taking the prosthesis at night [2,3]. After all meals, the prosthetic devices must be washed with soap or a chlorhexidine disinfectant solution [2,5,6].

According to the data collection, other risk factors found for the appearance of prosthetic stomatitis are the use of the same prosthesis, for an indefinite period, and not going

to the dentist, within the recommended timeframe [4].

Thus, according to the literature, patients who do not make annual reviews of their prosthesis, in order to assess possible maladjustments, to assess their condition and to assess oral mucosa, combined with the lack of oral and prosthetic hygiene are more likely to trigger the pathology [5,6]. On the other hand, the older a dental prosthesis is, the more likely it is to be associated with the aforementioned pathology, since acrylic, as it is a very porous material, has a tendency to absorb pathological bacterial biofilm and may trigger stomatitis prosthetics in the oral mucosa [3,6].

CONCLUSIONS

Prosthetic stomatitis, when associated with angular cheilitis, may have a multifactorial etiology, despite recent scientific evidence suggesting that most cases are linked to fungal infections, namely by *Candida albicans*. Further studies and an increase in the sample of institutionalized elderly are needed to analyze other risk factors associated with the disease. To prevent the extension of lesions, prosthetic patients should be called regularly for dental appointments and a clinical examination of the oral cavity and removable prosthesis. Preventive measures should be developed to avoid the colonization of *Candida albicans* on the palatal mucosa and prosthesis, such as improvement of oral and prosthetic hygiene and prosthetic removable at night during sleep.

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