



Relationship between Periodontitis, Joint Diseases and Smoking in Patients Who Will Undergo Dental Implants

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Abstract

Arthritis is a chronic systemic immune disease, in addition to being an inflammatory disease that can use many tissues and organs, but mainly involves synovial joints. Smoking has been shown to be an important risk factor for oral cancer and pre-malignant lesions, tooth loss and destructive periodontal diseases, tooth loss and destructive periodontal diseases.

Keywords: Dental Implants; Periodontitis; Tobacco Use Disorder

Introduction

Chronic arthritis and periodontitis have pathogenic changes that have aroused interest in research on an association between these conditions [1]. The Periodontitis results in loss of connective tissue and bone support and is the leading cause of tooth loss in adults [2]. It is believed that the progression to periodontitis may occur due to a combination of events, including increased periodontopathic bacteria, increased levels of proinflammatory cytokines, proteolytic enzymes and prostaglandin E2 (PGE2), increased the reduction of levels of cytokine antagonists and protease inhibitors [3]. Arthritis is a chronic systemic immune disease, in addition to being an inflammatory disease that can use many tissues and organs, but mainly involves synovial joints [4]. Smoking has been shown to be an important risk factor for oral cancer and pre-malignant lesions, tooth loss and destructive periodontal diseases [5], tooth loss [6], and destructive periodontal diseases [7,8]. Higher prevalence, greater extent and severity of periodontal destruction were observed in current smokers than in non-smokers or ex-smokers. In addition, smoking is considered the main risk factor associated with chronic periodontal disease, which may also be associated with joint disease.

Objective

The aim of the present study was to relate periodontal disease with joint disease and smoking in patients who will undergo dental implants.

Materials and Methods

This study was approved by the Human Research Ethics Committee of the University of Uberaba (Uniube) by CAAE: 64947717.0.0000.5145. The patients were selected from December 2017 to September 2018 in the Specialization Course in Implantology, at Getúlio Vargas Polyclinic, University of Uberaba. We evaluated 83 patients divided into two groups: Patients with periodontitis (n=24) and patients without periodontitis (n=59). Medical and dental information was obtained from patients who agreed to participate in the study and that met the inclusion / exclusion criteria. Demographic data such as age, sex and ethnicity were collected. The medical records of patients undergoing dental implants were evaluated identifying those who had periodontitis. In the medical records of patients with

periodontitis, it was observed whether they had joint diseases or not. Thus, it was established the percentage of patients with periodontitis and joint diseases. A statistical analysis was performed using the GraphPad Prism 5 software (GraphPad, San Diego, California, USA). For data distribution, use Fisher's exact test. The level of significance assumed was 5% ($\alpha < 0.05$).

Results

83 patients were selected, 24 patients from the group with periodontitis and 59 from the group without periodontitis. Of the 24 patients with periodontitis, 66.67% were women, 87.5% were white, 33.33% had joint disease and 29.17% were smokers. Of the 59 patients without periodontitis, 74.58% were women, 93.22% were white, 11.86% had joint disease and 18.64% were smokers. There were no statistically significant differences in relation to gender ($p=0.5893$) and ethnicity ($p=0.4067$) between the group with periodontitis and the group without periodontitis, showing homogeneous distribution between the two groups. Regarding joint diseases, there was a statistically significant difference between group with periodontitis and group without periodontitis ($p = 0.0297$) as shown in Table 1. Regarding smoking, there was no statistically significant difference between the group with periodontitis and the group without periodontitis ($p=0.3790$).

Discussion

Periodontal therapy aims to reduce or eliminate pathogens and

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	Group with periodontitis (n=24)	Group without periodontitis (n=59)
Gender ^a	(8 : 16)	(15 : 44)
(M : F)	(33,33% : 66,67%)	(25,42% : 74,58%)
Ethnicity ^b	(21 : 3)	(55 : 4)
(W : NW)	(87,5% : 12,5%)	(93,22% : 6,78%)
Joint Diseases ^c	(8 : 16)	(7 : 52)
(Y : N)	(33,33% : 66,67%)	(11,86% : 88,14%)
Smoking ^d	(7 : 17)	(11 : 48)
(Y : N)	(29,17% : 70,83%)	(18,64% : 81,36%)

M- Male

F- Female

W- White

NW- Not White

Y- Yes

N- No

^aFisher's exact test, p=0,5893

^bFisher's exact test, p=0,4067

^cFisher's exact test, p=0,0297

^dFisher's exact test, p=0,3790

Table 1: Demographic characteristics and periodontal clinical data of 83 patients with periodontitis.

their metabolites, halting disease progression and maintaining oral health, comfort and function with adequate aesthetics, preventing the occurrence of periodontitis [9]. In the present study, the results showed that there was no difference statistically significant between ethnicity and gender when comparing groups with periodontitis and without periodontitis. Unlike studies that analyzed several risk factors for periodontal disease that were analyzed and confirmed by epidemiological research, such as: male gender [10] and non-white origin [11]. It was observed in the results that individuals with periodontitis are more likely to have joint diseases when compared to individuals without periodontitis. A previous study showed that joint disease and periodontitis there is production of pro-inflammatory cytokines in large quantities that occur tissue destruction in the periodontium and joints [12]. It is known that in joint diseases, smoking and periodontitis there is immune dysregulation with production of pro-inflammatory cytokines in large quantities, which would be contributing to tissue destruction both periodontal and joints, especially in smoking. Periodontitis is caused by gram-negative anaerobic bacteria, which colonize and organize a subgingival biofilm, cause dysbiosis in the host susceptible. *Porphyromonas gingivalis*, pathogenic bacteria that make up this biofilm, synthesizes a Peptidyl Arginine Deiminase (PAD) enzyme, which in pathological inflammatory conditions has been associated with decrease or loss of immunological tolerance to citrullinated proteins, favoring the development of arthritis in susceptible individuals. In addition, periodontitis is involved in the production of Antiprotein Antibodies Citrullinated (ACPA) [13], a specific arthritis marker that can be detected years before the onset of the disease and its presence is correlated with the severity arthritis [14,15]. A study conducted by Mercado demonstrated that in arthritis there is chronic exposure to lipopolysaccharides from pathogenic bacteria in the periodontium that may cause or intensify joint diseases [16]. Regarding smoking, there was no statistically significant difference between groups with periodontitis and without periodontitis (p=0.3790). The use of cigarettes alone it may not cause disease, because other pathogens and genetics may contribute to the etiology. Furthermore, in a study by Vinhas and Pacheco it showed

that there was no difference between a microbiota of smokers and non-smokers [17,18]. Thus, it is necessary to carry out further studies on the subject in question, in addition to being measures to adopt important preventive measures to prevent peri-implant diseases with consequent loss of implants.

Conclusion

The large percentage of patients with joint disease and smokers in the group of patients with periodontitis who will undergo dental implants would justify the need for preventive measures to worsen the inflammatory response, in order to prevent peri-implant diseases with consequent loss of dental implants.

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