

Prevalence of Oral Candidiasis in Periodontal Patients with Diabetes

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Abstract:

Diabetes mellitus is a metabolic disorder marked by increased glucose level. The prevalence of diabetes varies depending on age, race, geography and sex. Periodontitis which is a chronic inflammatory disease is seen more common in patients with diabetes mellitus. Poor oral hygiene, xerostomia, periodontitis and wearing dentures etc lead to the development of opportunistic infections such the oral candidiasis. These species grow in such favourable conditions. Their growth and survival period depends on the environmental condition of the mouth. The purpose of the study is to check for the prevalence of *Candida albicans* in periodontal patients with type 2 diabetes. Sub-gingival samples were collected from mesio-buccal aspect of the tooth for fungal analysis.

Keywords: Diabetes mellitus, candidiasis, periodontitis, glycemic control,

INTRODUCTION

Diabetes Mellitus (DM) is a group metabolic disorder marked by high levels of blood glucose resulting from defects in insulin production, insulin action or both. Prevalence of diabetes can vary depending on geography, age, sex and race. Besides the classical complications of the disease, DM has been associated with reduced response of T cells, neutrophil function, and disorders of humoral immunity.[1-2] DM is also associated with a greater likelihood of developing certain oral mucosal disorders. There is greater prevalence of lichen planus, recurrent aphthous stomatitis, and oral fungal infections. All these diseases have not been found in all populations of subjects with DM, but it may be due to alterations in immune responsiveness (Ship 2003). Another manifestation of DM and an oral sign of systemic immunosuppression is the presence of opportunistic infections, such as oral candidiasis. Several factors like poor glycemic control, xerostomia and wearing dentures, are associated with the development of candidiasis in diabetic patients. This may be superimposed with cigarette smoking and insufficient oral hygiene. The oral health care professional can readily make the diagnosis of oral candidiasis and provide therapy. Most importantly, the dentist should pursue the infection's aetiology. This may help in the detection of undiagnosed patients with DM (Ship 2003). DM is considered as a risk factor for development of periodontal disease. The glycemic control is an important factor which affects the prevalence and severity of periodontal disease. Several factors have been proposed to explain the increased susceptibility to periodontal diseases in diabetics, including alteration in subgingival microflora, alteration in host response and altered wound healing (Ryan et al. 2003) Periodontitis is a chronic inflammatory disease characterized by the formation of a periodontal pocket, loss of connective tissue, and alveolar bone resorption, which may sometimes result in tooth loss. It is four times more common in persons with DM and is considered the sixth

most common complication of DM.[3,4,5]. Periodontitis starts or disseminates insulin resistance, thus worsening glycemic control.[3,7,4,6] Inversely, persistent poor glycemic control has been associated with a greater incidence and progression of gingivitis and periodontitis, producing a vicious circle.[3,5,6]

Many mechanisms have been proposed to explain the increased susceptibility to periodontal disease in these patients, such as alterations in immune response, subgingival microbiota aspects, altered collagen metabolism, alteration in oral vascularization, hereditary patterns, altered neutrophil function, reduced phagocytic capacity, and chemotaxis.[3,4]

OBJECTIVE:

The purpose of the study is to check for the prevalence of *Candida albicans* in periodontal patients with type 2 diabetes.

METHODS AND MATERIALS:

The study included 30 diabetic patients with periodontitis aged around 45-70 years. Detailed clinical history, medical history & informed written consent were obtained from each patient. The clinical measurement included probing pockets depth. Sub-gingival samples were collected from mesio-buccal aspect of the tooth for fungal analysis[8]. The samples were collected using sterile cotton swab and inoculated on Sabouraud's Dextrose Agar (SDA) with chloramphenicol and incubated at 25- 37°C for 2-3 days. To confirm the growth of *Candida albicans*, colonies from SDA were gram stained and inoculated in normal human serum and incubated at 37°C for 90 minutes to demonstrate germ tube formation.

RESULT AND DISCUSSION:

Out of the 30 participants, there were 12 subjects (7 males and 5 females) with *C. albicans* colonisation. The isolates from SDA agar were gram stained which showed the

presence of gram positive yeast cells, and confirmed for *Candida albicans* by performing germ tube experiment which showed the formation of pseudohyphae. Among 30 periodontal patients with diabetes screened for the prevalence of *Candida albicans*, 12 patients [40%] were found to be positive for *Candida albicans* growth.

Candida is one of the commonest opportunistic pathogens that cause disease in compromised hosts. Amongst the important predisposing factors for *Candidal* colonization are endocrinal disturbances like diabetes, blood diseases, immune deficiencies, antibiotic therapy, use of orthodontic appliances and total prosthesis. There are several important factors affecting the distribution and virulence of *Candida* like saliva, pH, adhesion, cell surface hydrophobicity, hyphae formation, production of phospholipases, proteinases or other metabolites, synergistic coaggregation or competition with bacteria and mechanisms for adaptation in the host environment. *C. albicans* express virulence factors that may have an important role in the pathogenesis of periodontal disease such as the ability of penetrating the epithelium, inhibiting neutrophils and causing lysis of monocyte. An extensive amount of research has examined the relationship between periodontal disease and diabetes, and it is clear that they share many biological mechanisms. Careful management of the diabetic patient may greatly reduce the potential for a decline in oral health as well as overall glycemic control.

CONCLUSION

The presence of yeasts in the oral cavities of diabetic patients has been researched in several parts of the world. The prevalence of yeasts obtained in our sample was 40%, confirming that variability, which could depend on social factors and on the sampling technique.

REFERENCE:

1. Geerlings SE, Hoepelman AI. Immune dysfunction in patients with diabetes mellitus (DM) FEMS Immunol Med Microbiol. 1999;26:256–65.
2. Peleg AY, Weerathna T, McCarthy JS, Davis TM. Common infections in diabetes: Pathogenesis, management and relationship to glycaemic control. *Diabetes Metab Res Rev.* 2007;23:3–13.
3. Peleg AY, Weerathna T, McCarthy JS, Davis TM. Common infections in diabetes: Pathogenesis, management and relationship to glycaemic control. *Diabetes Metab Res Rev.* 2007;23:3–13
4. Alves C, Andion J, Brandão M, Menezes R. Pathogenic aspects of the periodontal disease associated to diabetes mellitus. *Arq Bras Endocrinol Metab.* 2007;51:1050–7
5. Nagasawa T, Noda M, Katagiri S, Takaichi M, Takahashi Y, Wara-Aswapati N, et al. Relationship between periodontitis and diabetes - importance of a clinical study to prove the vicious cycle. *Intern Med.* 2010;49:881–5.
6. Simpson TC, Needleman I, Wild SH, Moles DR, Mills EJ. Treatment of periodontal disease for glycaemic control in people with diabetes. *Cochrane Database Syst Rev.* 2010;5:CD004714.
7. Rocha J, Baggio H, Cunha C, Niclewicz E, Leite S, Baptista M. Aspectos relevantes da interface entre diabetes mellitus e infecção. *Arq Bras Endocrinol Metab.* 2002;46:221–9