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Research Article

ORAL CANDIDA SPECIES IN PATIENTS WITH PERIODONTITIS AND DIABETES MELLITUS

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ABSTRACT

Aim: The aim of this study was to determine the prevalence of Candida species in periodontitis patients with diabetes mellitus and compare it with normal patients

Objective: The objective of the study is to count the fungal species among both the groups and do a comparative analysis

Background: Although the main reservoir of Candida species is believed to be the buccal mucosa, these microorganisms can coaggregate with bacteria in subgingival biofilm and adhere to epithelial cells. Such interactions are associated with the capacity of Candida to invade gingival tissue, and may be important in the microbial colonization that contributes to progression of oral alterations caused by periodontitis and diabetes mellitus.

Methods: Swab samples were collected from the gingival mucosa from patients visiting Saveetha dental college with their consent. The sample size was 25 for patients with DM and periodontitis and 25 for patients with periodontitis. The age group of the patients was of the range 55 to 75 years.

Results: Thus, it was seen that the growth of the organism was higher in patients with diabetes mellitus and periodontitis. Therefore, it is necessary to confirm the presence of Candida with a proper procedure to avoid an unjustified antimicrobial treatment.

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INTRODUCTION

Candida species is responsible for oral candidiasis. It is an opportunistic infection of the oral cavity. It is common and underdiagnosed among the elderly, particularly in those who wear dentures and in many cases is avoidable with a good mouth care regimen. It can also be a mark of systemic disease, such as diabetes mellitus and periodontitis and is a common problem among the immunocompromised. Diabetes mellitus (DM), commonly referred to as diabetes, is a group of metabolic diseases in which there are high blood sugar levels over a prolonged period. Periodontitis, also known as pyorrhea, is a set of inflammatory diseases affecting the periodontium, i.e., the tissues that surround and support the teeth. Oral candidiasis is caused by an overgrowth or infection of the oral cavity by a yeast-like fungus, candida.^[1,2] The important ones are C albicans, C tropicalis, C glabrata, C pseudotropicalis, C guilliermondii, C krusei, C lusitanae, C parapsilosis, and C stellatoidea. C albicans, C glabrata, and C tropicalis represent more than 80% of isolates from clinical infection^[3]. Although the main reservoir of Candida species is believed to be the buccal mucosa, these microorganisms can coaggregate with bacteria in subgingival biofilm and adhere to epithelial cells. Such interactions are associated with the capacity of Candida to

invade gingival tissue, and may be important in the microbial colonization that contributes to progression of oral alterations caused by periodontitis and diabetes mellitus.^[4] The aim of this study was to determine the prevalence of Candida species in periodontitis patients with diabetes mellitus and compare it with patients with periodontitis alone.

MATERIALS AND METHODS

Sample collection

Saliva swabs were collected using sterile cotton swabs from patients visiting Saveetha dental college. It was collected from patients with periodontitis and diabetes mellitus and also from patients having diabetes alone with proper consent. The sample size was 25 in each group. The age group of the patients were ranging from 65 to 80 years.

Culture of the sample

Then the sample was cultured in Hichrome candida differential agar and incubated at 37 degree celsius for 24 to 48 hours. After then, the growth of the species were noted especially Candida albicans.

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RESULTS

This study showed that out of 25 cultures in patients with DM and periodontitis, it was seen that 14 samples were positive for Oral candida species. Likewise, in the other 25 samples collected from patients with periodontitis, it was noted that 6 cultures had the growth of the candida species. Thus, the prevalence (56%) was higher in patients with both diabetes and periodontitis whereas less (24%) in patients with periodontitis. The reasons for this growth will be explained below.

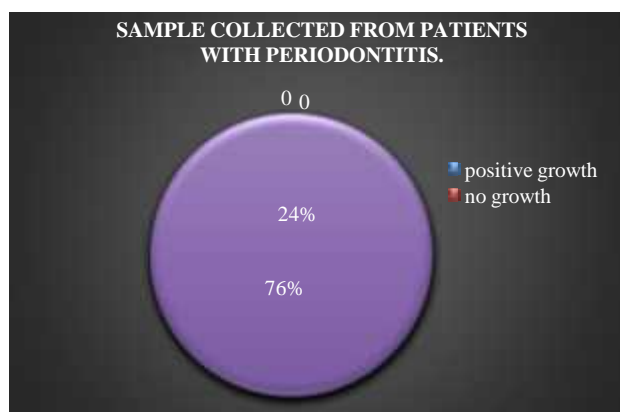


Fig.1 pictorial representation of growth of the species from patients with periodontitis

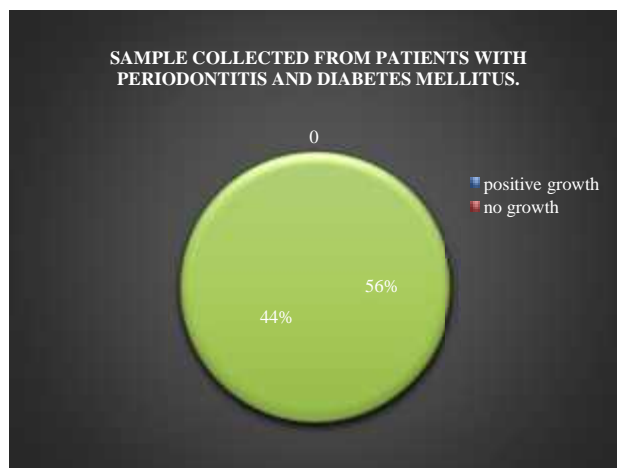


Fig.2 pictorial representation of growth of the species from patients with periodontitis and diabetes mellitus

DISCUSSION

In reference to the study done by Martinez *et al* [5], showed that the growth of candida species was higher in patients with poor glycemic control. This study also showed similar results. The patients had a growth of candida species because of the periodontitis which is in turn caused by higher diabetic level. Thus they causes lesions on the oral cavity in which colonosization of candida species is seen. According to Hill *et al*. [6] diabetes by itself does not put a patient at risk of developing fungal infections, unless his/her metabolic control is poor. May be in this study the patients had a higher range of sugar level which lead to periodontitis and colonization of candida species would have occurred. Amongst the important predisposing factors [7] 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 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. Other factors are smoking, diabetes, Cushing's syndrome, immunosuppressive conditions such as HIV infection, malignancies such as leukaemia, and nutritional deficiencies-vitamin B deficiencies have been particularly implicated. Ninane found that 15%–60% of people with malignancies will develop oral candidiasis while they are immunosuppressed [8]. In those with HIV infection rates of between 7% to 48% have been quoted and more than 90% has been reported in those with advanced disease. Relapse rates are between 30% and 50% on completion of antifungal treatment in severe immunosuppression [9].

CONCLUSION

Thus the results of the study showed that patients with periodontitis and diabetes mellitus have a higher risk of developing candida infection. In conclusion, there was a significant difference in colonization for the Candida spp. between diabetic and periodontal disease compared to patients with diabetes alone. The colonization of the candida species might cause progression of oral diseases in patients [10]. Therefore, it is necessary to confirm the presence of Candida with a proper procedure to avoid an unjustified antimycotic treatment. Moreover the diabetic patients can be given proper awareness to have a regular dental checkup so that they can prevent candida species colonisation.

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