

EFFECT OF GENDER, DAY AND NIGHT USE OF COMPLETE DENTURE ON ORAL CANDIDAL GROWTH

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ABSTRACT

Background: Poor prosthetic hygiene is related with high level of oral candidal infection and many factors are being evaluated as its risk factors. **Objective:** The objective of present study was to determine whether gender and overnight denture wearing affects oral Candidal growth. **Setting:** Department of Prosthodontics, Lahore Medical and Dental College and Pathology Department, Microbiology Section of Lahore Medical & Dental College, Lahore. **Patients and Methods:** Forty edentulous patients including 20 male and 20 females, who fulfilled the inclusion criteria i.e. first time complete denture wearer between 50 to 65 years of age were included in this cross-sectional study. Exclusion Criteria: Patients with history of treatment with chemotherapy or radiotherapy in past six months, smokers and diabetic were excluded from the study. Oral rinse on same time a day technique was used for sample collection in which patient was provided 10 ml of sterile saline in a sterile disposable container and requested to rinse for 60 sec. It was sent to Microbiology section of Pathology Department, Lahore Medical & Dental College, Lahore. Qualitative and quantitative growth of candida was studied. Microscopy, Gram stain and colony count was done. **Results:** Difference in candidal growth was significantly higher after one month of wearing complete denture in females. Results showed that overnight denture wearing caused a higher candidal growth. **Conclusion:** General population and specially, females should be given the awareness that their oral hygiene is important and dentures should be taken off at night, as they do with their eyeglasses. This will prevent denture stomatitis.

Key Words: Candidal count, Complete denture, Gender.

INTRODUCTION

Candida albicans is widely distributed yeast and a commensal organism. Changes in the oral microbial flora predisposes a person to change from a carrier state to the infectious state. *Candida* associated denture stomatitis is a common disease in denture wearers. Complete edentulism has an impact on patients' life style and quality. The use of a dental prosthesis is indispensable for functional and esthetic rehabilitation of edentulous patients. Treatment with complete dentures has resulted in a high degree of success in edentulous patients. The number of elderly people in the world is increasing.¹ It has been estimated that the need for denture will rise to 37.9 million adults in 2020.² Denture plaque was described as microbial layer with their metabolites. Denture plaque has essentially the same composition as dental plaque except increased number of candida

species.³

Candida albicans is a yeast like fungus present as commensal in oral cavity, gastrointestinal tract and female genital tract of the healthy individuals.^{4,5} Denture plaque containing candida might give rise to oral candidiasis like oral thrush or denture induced stomatitis. It can also cause caries and periodontitis of abutment teeth. Chances of infection are considerable in immune-compromised or medicated elderly.^{3,6} In denture wearers the prevalence of candida colonization can increase from 60% to 100%. Roughness and irregularities of the denture cause candida to stay on even after cleaning, thus causing continuous reinfection of the palate.^{7,8} Failure to maintain satisfactory prosthesis hygiene is related with high level of oral candidal infection.⁹ The pathological reaction of the dental bearing mucosa caused by trauma from ill fitting denture is called denture stomatitis. If candida is found in the lesion, the term candida associated denture stomatitis issued.¹⁰ Oral candidiasis in the form of candida-associated denture stomatitis is a common disease in denture wearers and *Candida albicans* is considered the primary etiologic agent.^{11,12}

The objective of this study was to determine whether gender and overnight denture wearing affects oral candidal growth.

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PATIENTS AND METHODS

Setting: Department of Prosthodontics and Pathology Department, Microbiology sections of Lahore Medical & Dental College, Lahore.

In this cross-sectional study, forty edentulous patients (20 male and 20 female) who fulfilled the inclusion criteria, were selected by purposive, non-probability sampling technique.

Inclusion criteria: First time complete denture wearers between 50 to 65 years of age.

Exclusion criteria: Patient with history of treatment with chemotherapy or radiotherapy in past six months, smokers and diabetics.

Oral rinse technique was used for sample collection in which patient was provided 10 ml of sterile saline, in a sterile disposable container and requested to rinse their mouth for 60 seconds.

Rinse was collected in sterile container to minimize the effect of diurnal variation, meals and brushing. The sample was collected at the same time of the day i.e. between 9 and 10am.

Oral rinse samples were centrifuged at 1700g for 10 minutes. Supernatant was discarded and one ml of saline added. Further process was carried out in the Microbiology laboratory where *Candida albicans* was identified. Direct examination of the sample was done and then cultured on Sabouraud's media. Growth obtained was examined grossly and microscopy was done to identify candida. Germ tube test was also done to confirm the diagnosis. The data was entered in SPSS version 15 and analyzed. P value of <0.05 was taken as significant.

RESULTS

A total of forty edentulous patients who were provided first time with complete denture were included in this study. Majority of patients were between 60 to 64 years of age. Minimum age was 50 years and maximum age was 65 years. Out of 40 patients 20 (50%) were male and 20(50%) were females. At the time of insertion candida count was zero in all patients. After one month of wearing complete dentures candida count was zero in 26 (65%) patients and 14 (35%) had positive outcome. Change was significantly higher after one month of wearing complete dentures (P=0.0001).

Difference in candidal count was significantly higher after one month of wearing complete dentures in females than males as shown in the

table I. A question was also asked in the study about over night denture wearing. Results showed that candidal growth was higher in patients who wore denture day and night.

Table I: Comparison of candidal growth at the time of insertion and after one month of wearing complete dentures with respect to gender.

Candidal growth	At the time of insertion	After one month of wearing complete denture	P-Value
Male (20)			
Negative	20(100%)	15(75%)	0.063
Positive	0 (0%)	5 (25%)	
Female (20)			
Negative	20(100%)	11 (55%)	0.004
Positive	0 (0%)	9(45%)	
Total			

Out of 20 females: 11(55%) showed negative results, i.e. no candida grew but 9(45%) showed positive growth.

In this study, 4 (80%) out of 5 positive males for candida were day and night wearer of denture.

Out of 20 females, 9 females were positive for candidal growth after one month denture use, whereas, out of 9 positive female cases, 7 (77%) were day and night wearers of the denture.

DISCUSSION

The results of the study support the hypothesis that there is significant quantitative alteration in the candidal count when complete denture is worn for a month. In this study oral carriage of candida count was higher in females which are coherent with many other studies.^{13,14} Alkumru and Beydemir¹⁵ also concluded that candidal carriage was greater in females than male. This might be explained by the fact that women have more candidal load on the basis of iron deficiency anemia and hormonal changes. The majority of the women were in an age group where menopause is likely to occur.¹³

Davenport¹⁶ results showed that candidal carriage is more in males than females. Kulak and Arikan¹⁷ also found higher denture induced stomatitis in males. Smoking is more common in males; this may be the reason for higher count.

Our study showed that individuals who wore their complete dentures day and night had more candidal infections than those who wear them only when awake.

In this study day and night wearing of denture is more common in woman and so is the candidal carriage count, may be females for cosmetic reasons do not take them off. Continuous wearing of dentures is common in patients with denture stomatitis.¹⁸ Overnight denture wear produces immediate alterations on candidal growth.

CONCLUSION

Results of this study suggested that the high candidal growth in saliva after complete denture provision is an important factor that can cause denture stomatitis. It is important, both for individuals and for public health in general that information regarding risk factors of oral infection be made available. Regular denture hygiene instructions and patients' motivation with new dentures are fundamental to maintain adequate oral hygiene and to prevent denture stomatitis. Females should be given the awareness that their oral hygiene is very important and that they should take off their dentures at night without hesitation, as they do with their eye glasses at night. This will help them prevent denture stomatitis.

REFERENCES

- Compagnoni MA, Souza RF, Marra J, Pero AC, Barbosa DB. Relationship between Candida and nocturnal denture wear: quantitative study. *J Oral Rehabil* 2007; 34: 600-5.
- Dhir G, Berzins DW, Dhuru VB, Periathamby AR, Dentino A. Physical properties of denture base resins potentially resistant to Candida adhesion. *J Prosthodont* 2007; 16: 465-72.
- Nikawa H, Hamada T, Yamamoto T. Denture plaque-past and recent concerns. *J Dent* 1998; 26: 299-304.
- Segal E. Candida, still number one- what do we know and where are we going from there? *Mycoses* 2005; 48: 3-11.
- Bhatti MA, Karmarkar R, Wagner DK. Candida albicans myocardial abscess. *J Coll Physicians Surg Pak* 2003; 13: 456-8.
- Nikawa H, Hamada T, Yamashiro H, Kumagai H. A review of in vitro and in vivo methods to evaluate the efficacy of denture cleansers. *Int J Prosthodont* 1999; 12: 153-9.
- He XY, Meurman JH, Kari K, Rautemaa R, Samaranayake LP. In vitro adhesion of Candida species to denture base materials. *Mycoses* 2006; 49: 80-4.
- Perezous LF, Stevenson GC, Flaitz CM, Goldschmidt ME, Engelmeier RL, Nichols CM. The effect of complete dentures with a metal palate on candida species growth in HIV-infected patients. *J Prosthodont* 2006; 15: 306-16.
- Darwazeh AM, Al-Refai S, Al-Mojaiwel S. Isolation of Candida species from the oral cavity and fingertips of complete denture wearers. *J Prosthet Dent* 2001; 86: 420-3.
- Budtz-Jorgensen E. Sequelae caused by wearing complete dentures. In: Zarb GA, Bolender CL, Eckert SE, Jacon RF, Fenton AH, Mericske-Stern R. *Prosthodontic treatment for edentulous patients; complete dentures and implant supported prostheses*. 12th ed. St. Louis: Mosby 2004; 35-40.
- Webb BC, Thomas CJ, Willcox MD, Harty DW, Knox KW. Candida-associated denture stomatitis. Aetiology and management: a review. Part 3. Treatment of oral candidosis. *Aust Dent J* 1998; 43: 244-9.
- Shulman JD, Rivera-Hidalgo F, Beach MM. Risk factors associated with denture stomatitis in the United States. *J Oral Pathol Med* 2005; 34: 340-6.
- Figueiral MH, Azul A, Pinto E, Fonseca PA, Branco FM, Scully C. Denture-related stomatitis: identification of aetiological and predisposing factors a large cohort. *J Oral Rehabil* 2007; 34: 448-55.
- Pires FR, Santos EB, Bonan PR, DeAlmeida OP, Lopes MA. Denture stomatitis and salivary Candida in Brazilian edentulous patients. *J Oral Rehabil* 2002; 29: 1115-9.
- Alkumru HN, Beydemir K. The prevalence of Candida albicans in complete denture and removable partial denture wearers: a comparative study. *J Marmara Univ Dent Fac* 1992; 1: 218-22.
- Davenport JC. The oral distribution of candida in denture stomatitis. *Br Dent J* 1970; 129: 151-6.
- Kulak Y, Arıkan A. Aetiology of denture stomatitis. *J Marmara Univ Dent Fac* 1993; 1: 307-14.
- Azad AA, Habib SR, Rehman A. Denture induced stomatitis in edentulous population. *J Pak Dent Assoc* 2006; 15: 195-9.