Assessment of denture stomatitis in removable denture wearers and its correlation with variable factors such as age, gender, length of denture use and nocturnal dental care

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Introduction

Teeth are shining boon for human beings. In todays, modern times removable dentures have been overtaken by fixed prosthesis. Nevertheless, removable dentures still are used by people to meet their functional and esthetic demands.

Oral mucosal lesions associated with wearing of removable and fix dentures may lead to acute or chronic reactions to microbial denture plaque, which in itself may result due to constituents of the denture base material, or a mechanical denture injury. The lesions constitute a heterogeneous group with regard to pathogenesis. Denture stomatitis, angular cheilitis, traumatic ulcers, denture irritation hyperplasia, flabby ridges, and oral carcinomas fall under this ambit.[1,2] This study was planned to determine effects of dentures among patients in terms of denture stomatitis.

Materials and Method

Removable partial and complete Denture wearers were screened in People's Dental Academy. Patients with systemic conditions (such as diabetes, hypertension, etc) and with medications were excluded from our study. A total of hundred removable denture wearers were interviewed and examined. Patients were informed about the study and written consent was obtained. Data related to gender, age, type of denture, length of denture use, hygiene care, nocturnal denture wear, symptoms, and presence of DML was obtained. The patients were divided into two age groups: (1) < 50 years, and (2) ≥ 50 years. Denture wearers were divided into complete denture wearer (CDW) and partial denture wearer groups (PDW). The length of denture use was categorized into two groups: (1) < 5 years of use and (2) ≥ 5 years of use. Soft tissue examination was undertaken by using a mouth mirror and gauze compresses. Denture stomatitis diagnosis was made based on the clinical appearance of the inflamed palatal mucosa, regardless of the presence of Candida albicans in cytological smears obtained from the affected area. The cases of denture stomatitis were classified into three clinical types (6): type 1, hyperaemia; type 2, generalized erythema and; type 3, papillary hyperplasia. Results were tabulated and statistical analysis was done.

Results

A total of 100 removable denture wearers formed the study group. In our study, 80 were males and 20 females. 62 patients were less than 50 years of age and the remaining were over 50 years. The results were statistically significant (p value 0.018) [Table 1]. 79 patients were using Partial Dentures (PDs).

Table 1: Correlation of variables including age and type of denture with gender

Variables	Male	Female	Total	P Value
Age < 50 yrs	54	08	62	0.018
Age > 50 yrs	26	12	38	
CDW	15	06	21	0.001
PDW	65	14	79	

We observed that 78 patients were wearing dentures for more than 5 years. Cleaning habits were more prevalent amongst males including both mechanical and a combination of mechanical and chemical. The p value was significant [Table 2].

Table 2: Correlation of variables with gender

Variables	Male	Female	Total	P Value
Length of Use < 5 yrs	14	08	22	0.003
> 5 yrs	66	12	78	
Method of Cleaning Mechanical	68	13	81	0.013

Mechanical & Chemical	12	07	19	

Surprisingly, 83 denture wearers used the dentures at night too. The p value was not significant [Table 3].

Table 3: Correlation of variables with gender

Variables	Male	Female	Total	P Value
Nocturnal Denture Use Yes	65	18	83	0.382
No	15	02	17	

We found that out of 100, 38 patients showed denture stomatitis in the form of hyperaemia (n=15), generalized erythema (n=8) and, papillary hyperplasia (n=15) [Table 4]. The data was compared within CDWs and PDWs. The values obtained were non significant.

Variables	CDW	PDW	Total	p value
Hyperaemia	6	9	15	Not significant
Generalized erythema	2	6	8	
Papillary hyperplasia	5	10	15	

Multivariate logistic regression analysis

Variables	Estimated regression coefficient (standard deviation)	Odds Ratio	p-value
Female gender	1.99 (0.72)	7.38	0.0059
Age > 50 years	1.40 (0.61)	4.09	0.0229
Length of use > 5 years	1.17 (0.52)	3.23	0.0239
Mechanical Cleaning	0.89 (0.64)	2.44	0.004
CDW	0.32 (0.49)	1.38	0.5133

Few patients had pinpoint erythematous areas which were negative for candida hyphae even after removing the denture during night and maintaining good oral hygiene. This can be attributed to the rough abraded tissue surface leading to irritation and erythema.

Discussion

Denture stomatitis, one of the commonest lesions seen in patients wearing an upper complete denture, specially when they are not hygienically maintained and further if they are used at night during sleep. Older dentures are more likely to be involved which may be due to various reasons such as abraded surfaces due to wear and tear, leaching of irritant materials, etc.[3] Other predisposing factors include xerostomia (dry mouth), diabetes or a high carbohydrate diet.

Previous studies have shown that women exhibit for chances of denture stomatitis compared to men.[4,5,6]

Contrarily, few studies have also shown contrasting results depicting a strong association between males and denture stomatitis[7] while still others showing no gender-related effects.[8,9]

Higher prevalence of denture stomatitis in women in the present study relates to improper maintenance of oral hygiene and negligence of the same.

Present study shows direct relation of plaque accumulation and denture stomatitis, which are in accordance to other studies.[10] The importance of oral microorganisms in the etiology of denture related stomatitis was explained by Cawson[11] and Budtz-Jorgensen believed that oral fungi, predominantly Candida species, are vital for the development of denture stomatitis.[12,13,14]

Candida species are believed to induce the inflammatory response, a characteristic of denture stomatitis, by principally releasing yeast antigens, toxins and irritants from the denture associated plaque.

Wearing dental appliances such as fixed or removable prostheses alters the normal oral microflora. A microbial plaque comprising of bacteria and/or yeasts covers the fitting surface of the denture (the surface which rests against the palate) and on the mucosa which is covered. With repeated insults and predisposing factors, this plaque may get colonized by Candida species. The hood under the denture leads to an acidic environment causing inaccessibility to the cleansing action of saliva, which in turn encourages high Candida enzymatic activity leading to inflammation in the mucosa. Candida albicans is the most commonly isolated organism, but occasionally bacteria are implicated.[15]

Cleaning the denture surface with abrasives instead of chemical solutions lead to development of retention areas for Candidal hyphae due to the abrasion it causes.[16]

Smokers are more prone to be affected by denture stomatitis. The effects of tobacco on this increased susceptibility to oral Candida infections are probably a result of a combination of factors, including a suppression of the activity of oral leucocytes mediated by smoking, changes in oral mucosal surface due to denture friction associated with tobacco smoking and immunosuppression.[17]

Careless patients who neglect the health of their dentures have strong chances to develop denture stomatitis.[18] This is seen more in geriatric patients as they shy to seek dental care.[19] Hence, we as health care professionals become morally and ethically responsible to educate them for the same and encourage them to maintain proper oral hygiene.

Study conducted by us shows occurrence of denture stomatitis in those who used their dentures for long time or who do not remove them while sleeping.[20]

Conclusion

Denture stomatitis is a prevalent disease which needs specific attention by the patients themselves as well as oral health care professionals. Through our study we need to focus the attention of our readers to inculcate a specific program for educating their patients who use removable prostheses.

References

1. Moosazadeh M, Akbari M, Tabrizi R, et al. Denture Stomatitis and Candida Albicans in Iranian Population: A Systematic Review and Meta-Analysis. Journal of Dentistry. 2016;17(3 Suppl):283-292.
2. Aoun G, Cassia A. Evaluation of denture-related factors predisposing to denture stomatitis in a Lebanese population. Materia Socio-Medica. 2016;28(5):392-396. doi:10.5455/msm.2016.28.392-396.
3. Tyldesley, Anne Field, Lesley Longman in collaboration with William R. (2003). Tyldesley's Oral medicine (5th ed.). Oxford: Oxford University Press. pp. 35–40.
4. Figueiral MH, Azul A, Pinto E et al. Denture-related stomatitis: identification of aetiological and predisposing factors – a large cohort. J Oral Rehabil 2007;34:448–455.
5. Zissis A, Yannikakis S, Harrison A. Comparison of denture stomatitis prevalence in 2 population groups. Int J Prosthodont 2006;19:621–62.
6. Camila Mello dos Santos, Juliana Balbinot Hilgert, Dalva Maria Pereira Padilha, Fernando Neves Hugo. Denture stomatitis and its risk indicators in south Brazilian older adults. Gerodontology. 2009; doi:10.1111/j.1741-2358.2009.00295.x
7. MacEntee MI, Glick N, Stolar E. Age, gender, dentures and oral mucosal disorders. Oral Dis 1998;4:32–36.
8. Espinoza I, Rojas R, Aranda W et al. Prevalence of oral mucosal lesions in elderly people in Santiago, Chile. J Oral Pathol Med 2003;32:571–575.
9. Wilson J. The aetiology, diagnosis and management of denture stomatitis. Br Dent J. 1998;185:380-4.
10. Khasawneh S, al-Wahadni A. Control of denture plaque and mucosal inflammation in denture wearers. J Ir Dent Assoc 2002;48:132–138.
11. Cawson RA. Denture sore mouth II. The role of Candida. Dent Pract 1965;16:138–142.
12. Budtz-Jorgensen E, Bertram U. Denture stomatitis I. The etiology in relation to trauma and infection. Acta Odontol Scand 1970;28:71–92.
13. Budtz-Jorgensen E, Bertram U. Denture stomatitis. II. The effect of antifungal and prosthetic treatment. Acta Odontol Scand 1970;28:283–304.
14. Budtz-Jorgensen E. Denture stomatitis. 3. Histopathology of trauma- and candida-induced inflammatory lesions of the palatal mucosa. Acta Odontol Scand 1970;28:551–579.
15. Scully, Crispian (2008). Oral and maxillofacial medicine: the basis of diagnosis and treatment (2nd ed. ed.). Edinburgh: Churchill Livingstone. pp. 201–203.
16. Dills SS Olshan AM Comparison of the antimicrobial capability of an abrasive paste and chemical-soak denture cleaners. J Prosthetic Dentistry. Oct 1988.vol 60:4,pg 467-470.
17. Soysa NS, Ellepola AN. The impact of cigarette/tobacco smoking on oral candidosis: an overview. Oral Dis 2005;11:268–273.
18. Mikkonen M, Nyysso¨ nen V, Paunio I et al. Oral hygiene, dental visits and age of denture for prevalence of denture stomatitis. Community Dent Oral Epidemiol 1984;12:402–405.
19. Hugo FN, Hilgert JB, de Sousa Mda L et al. Correlates of partial tooth loss and edentulism in the Brazilian elderly. Community Dent Oral Epidemiol 2007;35:224–232.
20. Coelho CM, Sousa YT, Daré AM. Denture-related oral mucosal lesions in a Brazilian school of dentistry. J Oral Rehabil. 2004;31:135-9.