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Assessment of Diabetic Status in Denture Stomatitis and Angular Cheilitis Patients in a University Hospital Setting - A Retrospective Analysis

Research Article

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Abstract

Denture stomatitis and angular cheilitis is a form of oral candidiasis. It is a common opportunistic infection in diabetic patients. Presence of denture in the oral cavity of diabetic patients can increase the incidence of denture stomatitis and angular cheilitis. The aim of our study was to assess the diabetic status among the patients with denture stomatitis and angular cheilitis. This study is a Retrospective study conducted in a University hospital setting. The study population consists of 99 patients with denture stomatitis and angular cheilitis who had reported to the department of Oral Medicine and Radiology, Saveetha Dental College and Hospitals, Chennai, India. The data regarding the age, gender, diabetic status and clinical presentation of the patients were retrieved from patients records and analysed. The data with a total 86000 patients records between June2019 to March 2020 were taken and after fulfillment of inclusion and exclusion criteria, a final sample of 99 patients were considered.The data were tabulated and analysed by SPSS software and statistics done using Chi Square test with significance kept at p<0.05. Prevalence of diabetic patients was found to be 15.1% among the study population. The prevalence of diabetic patients with Denture stomatitis was 11.1% and angular cheilitis was 4%. Lesser number of patients with denture stomatitis and angular cheilitis were found to be diabetic Chi square p value-0.095(p>0.05). It was observed that prevalence of diabetic patients was found to be very less among the study population and no significant association was seen between diabetes and candida related lesions such as denture stomatitis and angular cheilitis.

Keywords: Denture Stomatitis; Angular Cheilitis; Oral Candidiasis; Diabetic.

Introduction

Diabetes mellitus is a common and growing global health problem which causes several complications. Diabetes has an increased predisposition to the manifestation of oral disease like candidiasis, denture stomatitis and angular cheilitis which are associated with poor glycemic control and therapeutic dentures [1]. This predisposition also contributes to xerostomia, which may be due to increased glucose levels. Wearing complete dentures is also known as a risk factor, which can promote Colonization of candida, produce candida biofilm and result in oral candidiasis [2]. Association of denture and diabetes can increase the incidence of oral candida disorders in diabetic patients [1, 3].

Diabetes mellitus is a chronic metabolic disease, which causes several disorders [2, 4]. Immunodeficiency and increased susceptibility to opportunistic infections are seen in diabetic patients. Colonization of candida is more prevalent in people with diabetes mellitus [1, 2]. Many studies have shown a higher prevalence of candidal colonization in the oral cavity of diabetes when compared to non-diabetic individuals [5, 6]. In addition, a significantly higher prevalence of oral candidiasis in people with diabetes is reported [7].

Candidal infection is found commonly in denture wearers [8].

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Acrylic dentures are an important predisposing factor for oral candidosis as these appliances, which are usually ill fitting with suboptimal hygiene, act as reservoirs of infection. It is also reported that high salivary yeast counts are much more common in complete denture wearers than indentate individuals [9] Commensal existence of intra oral candida species varies from 20% to 50% in a healthy edentulous population and up to 75% in denture-wearers [10]. The manifestation of oral candidiasis can occur in many different forms including median rhomboid glossitis, atrophic glossitis, denture stomatitis and angular cheilitis. Candidiasis is associated with a high density of yeasts in lesions [11].

Denture stomatitis is a term used to describe inflammatory changes in the oral mucosa of denture bearing tissues 11. These changes are characterized by erythema and are found under complete or partial dentures in both jaws, but more frequently in the maxilla [12]. According to the clinical aspects of the lesions, Newton classified denture stomatitis as pinpoint hyperaemia (type I), diffuse erythematous hyperaemia (type II) and granular hyperaemia (type III) [13].

Angular cheilitis is the clinical diagnosis of deep fissures affecting the angles of the mouth and has an ulcerated appearance [14]. Etiological factors in relation to angular cheilitis are infection, low vertical vertical dimension , prolonged use of antibiotics, sensitivity to denture materials, vitamin deficiencies etc [15]. The aim of the study is to assess the diabetic status in denture stomatitis and angular cheilitis.

Materials and Methods

This study is a single- centred retrospective study, carried out in a private dental college. The present study was approved by Institutional ethical committee [IEC] (Ethical approval number: SDC/SIHEC/2020/DIASDATA/0619-0320) and was in accordance with the ethical standards that were stipulated. All available records of patients from June 2019 - April 2020 were examined and a total of 86000 case sheets were reviewed. Patients above 18 years and those with candida related lesions such as denture stomatitis and angular cheilitis were included in the study. Those who visited outside the time frame, with other candida associated lesions were excluded from the study. Cross verification of data for

error was done by presence of additional reviewers and by photographs evaluation. Two examiners were involved in the study. Any patient with incomplete data was excluded from the study.

Data collection

Acquisition of data was done from the hospital database which records all patient details. The study included 99 patients with denture stomatitis and angular cheilitis. The collected data were grouped based on denture stomatitis and angular cheilitis .Age was categorised into 18 - 35 years, 36- 55 years and older than 55 years. Gender was categorised into males and females. The medical history of the patients with denture stomatitis and angular cheilitis were verified to assess the diabetic status in the study population.The data were entered in the system in a methodical manner. For this study, data regarding age, gender and diabetic status of the patients were collected. The data was then entered in excel manually and imported to SPSS for analysis. Incomplete or censored data were excluded from the study.
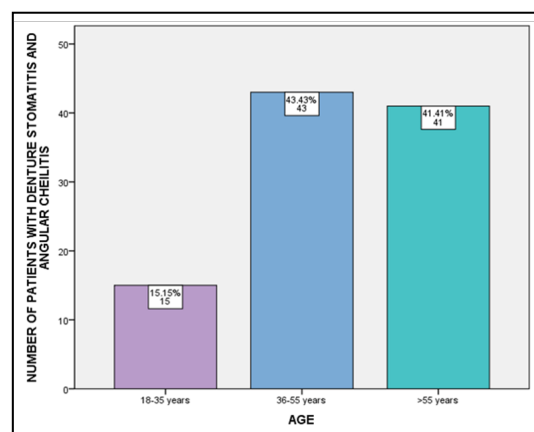
Statistical analysis

The statistical analysis was done using SPSS software (SPSS version 21.0, SPSS, Chicago II, USA). Descriptive statistics was used to summarise the demographic information of the patients included in this study. Descriptive statistics is used for the acquisition of frequency distribution of the data. Chi-square test was applied to analyse the association of different variables. Statistical significance was kept at p<0.05.

Results and Discussion

The study population consists of 99 patients above 18 years of age. Based on the distribution of study population by age, 15.1% of the patients were found within the age group of 18 - 35 years, 43.4% of the patients were found in the age group of 35 - 55 years and 41.4% of the patients were found over 55 years of age(Figure 1). Based on the distribution of population by gender, 47.4% of the patients were found to be males and 52.5% of the patients were found to be females (Figure 2). Based on the diabetic status of the patients, 15.1% of the patients were found to be diabetic and 84.1% of the patients were found to be non- diabetic

Figure 1. Bar chart represents frequency of age distribution among patients with denture stomatitis and angular cheilitis. X axis denotes the age group of the patients and Y axis denotes the number of patients with denture stomatitis and angular cheilitis. Patients with denture stomatitis and angular cheilitis were seen more in the age group of 36-55years (43.4%) when compared to other age groups.

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(Figure 3). Based on the prevalence of types of denture stomatitis among diabetic patients, 54.5% of the diabetics patients were found to present with Type II denture stomatitis and 45.4% of the diabetic patients were found to present with Type I denture stomatitis (Figure 4).

Based on the association of age group , denture stomatitis and angular cheilitis, 4% of the patients with denture stomatitis and 11.1% of the patients with angular cheilitis were found within the age group of 18- 35 years; 22.2% of the patients with denture stomatitis and 21.1% of the patients with angular cheilitis were found within the age group of 35 - 55 years; 28.2% of the patients with denture stomatitis and 13.1% of the patients with angular cheilitis were found over 55 years of age, p value-0.255 (p<0.05), statistically not significant (Figure 5). Association of gender and candida related lesion showed 23.2% of the patients with denture stomatitis and 24.2% of the patients with angular cheilitis were found to be males; 31.3% of the patients with denture stomatitis and 21.2% of the patients with angular cheilitis were found to be females, p value - 0.585 (P > 0.05), statistically not significant (Figure 6).

Association of age and diabetic status of the study population showed 1% of the patients with diabetes and 14.1% of the patients without diabetes were found within the age group of 18- 35 years; 5% of the patients with diabetes and 38.3% of the patients without diabetes were found within the age group of 35 - 55 years; 9% of the patients with diabetes and 32.2% of the patients without diabetes were found over 55 years of age, p value - 0.245 (P > 0.05) statistically not significant (Figure 7). 7% of the patients with diabetes and 40.4% of the patients without diabetes were found to be males; 8% of the patients with diabetes and 44.4% of the patients without diabetes were found to be females, p value - 0.585 (P > 0.05) (Figure 8). Association of diabetic status with denture stomatitis and angular cheilitis, 11.1% of the patients with denture stomatitis and 4% of the patients with angular cheilitis were found to be diabetic; 43.4% of the patients with denture stomatitis and 41.4% of the patients with angular cheilitis were found to be non-diabetic, p value - 0.095 (P > 0.05) statistically not significant (Figure 9).

Dorocka et al observed that 57.3% of diabetic patients had type II denture stomatitis [16]. This is similar to the results of our current study where 54.5% of diabetic patients had type II denture stomatitis. In a study of 463 randomly selected geriatric denture wearers, the prevalence of denture stomatitis was to be high as 65% [17] and these lesions are seen more frequently among women than men, which is in accordance with our study were denture stomatitis was more common in females. Axell et al says that prevalence of angular cheilitis is more frequently seen in

Figure 2. Bar chart represents the frequency of gender variation among patients with denture stomatitis and angular cheilitis. X axis denotes the gender of the patients and Y axis denotes the number of patients with denture stomatitis and angular cheilitis. Majority of patients with denture stomatitis and angular cheilitis were found to be females (52.5%) when compared to males (47.4%).
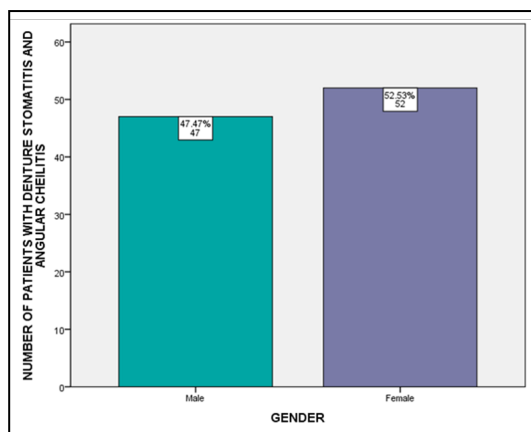

Figure 3. Bar chart represents the diabetic status of the patients with denture stomatitis and angular cheilitis. X axis denotes the diabetic status and the Y axis denotes the number of patients with denture stomatitis and angular cheilitis. Lesser number of patients with denture stomatitis and angular cheilitis were found to be diabetic (15.1%).
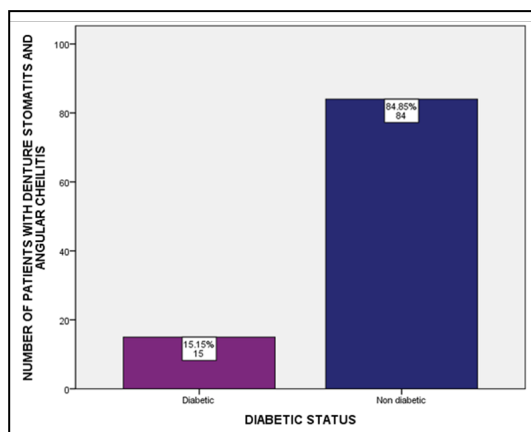
Figure 4. Bar chart represents the types of denture stomatitis in diabetic patients. X axis denotes the types of denture stomatitis and Y axis denotes the number of diabetic patients with denture stomatitis. Majority of the diabetic patients were found to present with Type II denture stomatitis (54.5%).
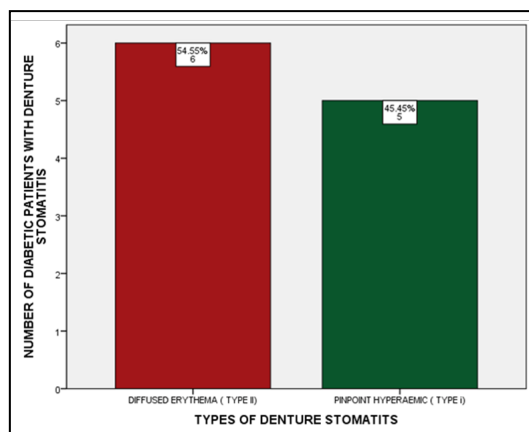

Figure 5. Bar chart represents the association between age and patients with denture stomatitis and angular cheilitis. X axis denotes age group of patients and Y axis denotes number of patients with denture stomatitis and angular cheilitis. Majority of the patients with denture stomatitis were over 55 years of age and patients with angular cheilitis were in 35- 55 years. Chi square analysis done, p value - 0.255 (P > 0.05), statistically not significant.
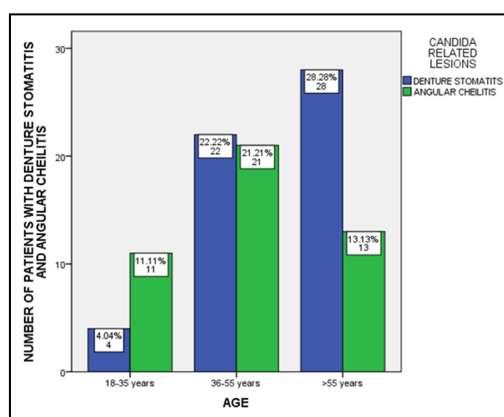

Figure 6. Bar chart represents the association between gender and patients with denture stomatitis and angular cheilitis. X axis denotes the gender of the patients and the Y axis denotes the number of patients with denture stomatitis and angular cheilitis. Majority of the patients with denture stomatitis were found to be females and patients with angular cheilitis were found to be males. Chi square p value - 0.585 (P > 0.05), statistically not significant.
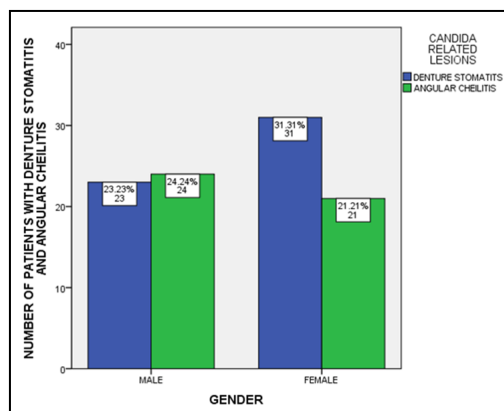
women than in men [18] which is in contrast to our study where angular cheilitis is more common in males. The prevalence of angular cheilitis among complete dentures wearers has been shown to vary between 8 and 30% [19, 16]. Rahmi et al., observed that prevalence of diabetes is high (65%) in the patients with angular cheilitis [20]. However, this is not similar to our result where only 4% of the diabetic patients had angular cheilitis. In a study conducted by Makila et al., it was observed that, in diabetic patients the prevalence of denture stomatitis was found to be as high as 75% [21], which does not support our result where only 11.1% of the patients were found with denture stomatitis. Literature says, people with type ll diabetes mellitus stand a higher risk of developing denture stomatitis than the non-diabetics [22].

In a study, the prevalence of denture stomatitis was found to be significantly higher in diabetic patients than in control subjects (P = 0.018) [23]. A literature search revealed conflicting reports about the association of denture stomatitis with diabetes mellitus [24]. A study reported that the prevalence of angular cheilitis was found to be significantly higher in diabetic patients than in control subjects (P < 0.05) [25], but our study results are contrary to the previous literature. It is generally acknowledged that diabetic patients are more susceptible to fungal infections, particularly to Candida albicans infections, than non-diabetic subjects [26]. Hyperglycemia due to poor metabolic control is one possible predisposing factor of oral candidiasis in diabetic patients. This can lead

Figure 7. Bar chart represents the association between age and diabetic status of the patients with denture stomatitis and angular cheilitis. X axis denotes the age group of the patients and the Y axis denotes the number of patients with denture stomatitis and angular cheilitis. Majority of the patients were found to be diabetic over 55 years of age. Chi square p value - 0.245 (P > 0.05). hence, statistically not significant.
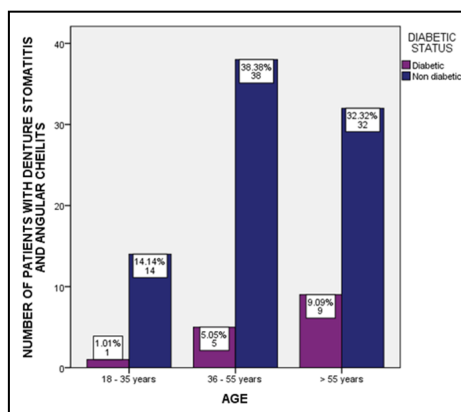

Figure 8. Bar chart represents the association between gender and diabetic status of the patients with denture stomatitis and angular cheilitis. X axis denotes the gender of the patients and the Y axis denotes the number of patients with denture stomatitis and angular cheilitis. Majority of the patients without diabetes were seen in females when compared to males. Chi square p value - 0.585 (P > 0.05), statistically not significant.
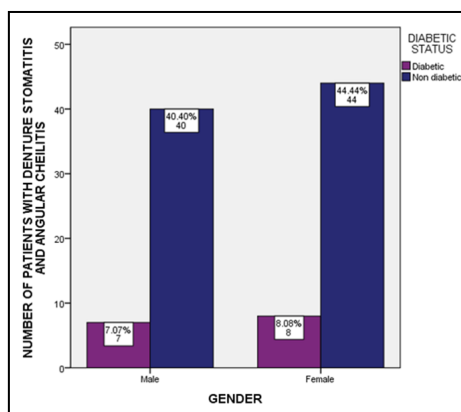

Figure 9. Bar chart represents the association between diabetic status and patients with denture stomatitis and angular cheilitis. X axis denotes the diabetic status of the patients and Y axis denotes the number of patients with candida related lesions. Lesser number of patients with denture stomatitis and angular cheilitis were found to be diabetic. Chi square p value - 0.095 (P > 0.05), statistically not significant.
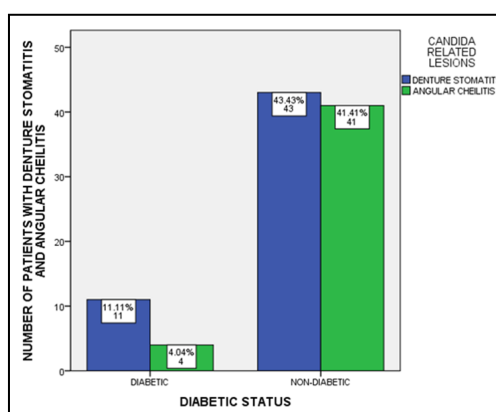
to the growth of Candida albicans and enhanced adhesiveness to the oral epithelium 21 in association with other local factors such as the presence of dental prostheses, salivary pH, salivary flow rate, and oral habits [26].

Thus, the current study is not in accordance with the previous literature, this evidence adds to the consensus and can be used in diagnosis in a clinical practice. Previously our team had conducted

numerous clinical trials [27-31] and lab studies [32-36] and *in vitro* studies [37-41] over the past 5 years. The limitations of the study could be smaller sample size. However, for better results and significance, cohort study can be done to assess the diabetic status among the patients with denture stomatitis and angular cheilitis on a larger sample size.

Conclusion

Within the limits of the study it was observed that, 15.1% of the patients with denture stomatitis and angular cheilitis were diabetic. Type II denture stomatitis were more common in diabetic patients.There was no significant association of diabetic status with denture stomatitis and angular cheilitis patients. However, glycemic levels should be monitored regularly in patients with diabetes to prevent candida associated lesions.

Acknowledgement

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