Journal of Research in Medical and Dental Science
2020, Volume 8, Issue 7, Page No: 163-167

Available Online at: www.jrmds.in
eISSN No. 2347-2367: pISSN No. 2347-2545

Correlation Between Diabetes and Completely Edentulous Condition-A Retrospective Study

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ABSTRACT

Diabetes mellitus is a disease of glucose, fat and protein metabolism resulting from impaired insulin secretion, varying degree of insulin resistance or both. Edentulism is a condition serving as a sign of constant oral and systemic disease process. It is known that the diabetes patients are prone to periodontal disease which is considered as the major reason for tooth loss. So, this study aims to correlate between the patients with diabetes and completely edentulous condition. A total of 392 patients with completely edentulous conditions were included in this study. Data was collected by reviewing patient records and by analysing the data of 86000 patients visited between June 2019 and March 2020. All the required data was recorded and analysed statistically by SPSS software using Chi Square test. From the analysis, it was found that the prevalence of completely edentulous condition was higher in Male patients. The incidence of completely edentulous condition with diabetes was 72%. There was a significant correlation ($p<0.05$) between diabetes and completely edentulous condition. From this study, we can conclude that the patients with diabetes were more prevalent to completely edentulous condition. Therefore, oral health care providers ought to create more awareness for diabetic patients with correct dental education.

Keywords: Glycemic control, Oral health, Systemic disease, Tooth loss

HOW TO CITE THIS ARTICLE: Sagana M, Revathi Duraisamy, Jeevitha M,Correlation Between Diabetes and Completely Edentulous Condition-A Retrospective Study, J Res Med Dent Sci, 2020, 8 (7): 163-167.

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Received: 27/09/2020

Accepted: 19/10/2020

INTRODUCTION

Edentulism is a debilitating and irreversible condition and is represented as the final marker of disease burden for oral health [1]. Teeth contribute to the process of chewing, speech and maintaining facial aesthetics. Factors contributing to tooth loss embody socioeconomic status, education attainment, access to care and psychological state [2]. Edentulism directly affects facial appearance, nutrition, and the ability to eat, speak and socialize. In contrast to other chronic morbid conditions which will be amenable to therapeutic treatment, edentulism could be a definitive condition that is the endpoint of periodontitis and tooth decay [3-5]. The comfort, function and esthetics must be restored altogether while treating a edentulous patients [6–9]. So, right dental treatment is required to hold good oral fitness [10]. The treatment for completely edentulous condition is complete removable prosthesis or fixed prosthesis supported by implants [11–14].

Though the prevalence of complete tooth loss has decreased over the last decade, edentulism remains a serious disease worldwide, particularly among adults [15,16]. However, there are intra and inter country variations in the prevalence of complete edentulism and direct comparison between national samples is tough because of the impact of varied factors like education, economic circumstances, lifestyle, oral health information, beliefs and attitude to dental care [17].

The consequences of periodontal disease and

resulting tooth loss are not only necessary issues for the quality of life of patients, however they will also influence overall health by having an unhealthy diet and causing social disability. The presence of systemic conditions like diabetes, hypertension, cardiovascular disease, respiratory disease, and endocrine disorder can individually or collectively contribute to tooth loss [18,19].

Diabetes and its complications are one of the most significant and growing chronic health problems in the world. Diabetes mellitus is a clinical syndrome characterised by hyperglycemic because of absolute or relative deficiency of insulin [20]. Diabetes is a serious condition which predisposes to several conditions like cellulitis [21]. There are two general classes of diabetes: Type 1, results from an absolute insulin deficiency. Type 2, results of insulin resistance and an insulin secretory defect [22]. A study stated that aloe vera has its uses in diabetes [23].

Diabetes is more commonly found in dental patients. Patients with diabetes mellitus present with increased risk of infections with reduced salivary flow, low salivary buffering capacity and inadequate hygiene to complete dentures. Diabetes mellitus increases the susceptibility to erosion and ulceration of oral mucosa where it meets the base of complete denture [24,25]. Most complete dentures with diabetes reports with dry mouth and oral and functional symptoms [26,27].

The presence of plaque, periodontal disease seems to be related to severe pathological events associated with diabetes [28]. There is proof that management of periodontal infection in patients with poorly controlled diabetes may very well help improve glycemic control [29]. Tooth loss is an inevitable result of periodontitis [30]. By this, we can say that there is a relationship between tooth loss and diabetes. This study aims to correlate the relationship between the patients with completely edentulous condition and diabetes.

MATERIALS AND METHODS

Data of patients with completely edentulous condition were collected by reviewing records of 86000 patients. Sample collected was from June 2019 to March 2020. A total sample data 392 of patients were included in this study. All the case sheets in Dental information archiving software were reviewed and cross verified with photographs. Approval from the ethical committee was taken before starting the study. The parameters that were collected are age, gender and presence or absence of diabetes. The patients with completely edentulous conditions were included in the study. Incomplete data were cross verified through phone calls to the patients and rejected data were excluded. All these data were entered in Microsoft excel sheet and analysed by SPSS software using Chi Square test.

RESULTS AND DISCUSSION

Out of the total number of 392 completely edentulous patient's data, it was found that 56% were male and 44% were female (Figure 1). The proportion of Male patients with completely edentulous conditions were higher than females. The incidence of completely edentulous patients with diabetes were found to be 72% and about 28% were found to be non-diabetic (Figure 2). About 67% of patients with completely edentulous condition were found between the age group of 50- 70 years. About 18% of patients with completely edentulous patients were found between the age group of 70-90 years and about 15% were between the age group of 30-50 years of age (Figure 3).

Among the diabetic patients, 54% were found to be male and 46% were found to be female. About 75% of patients with diabetes were found

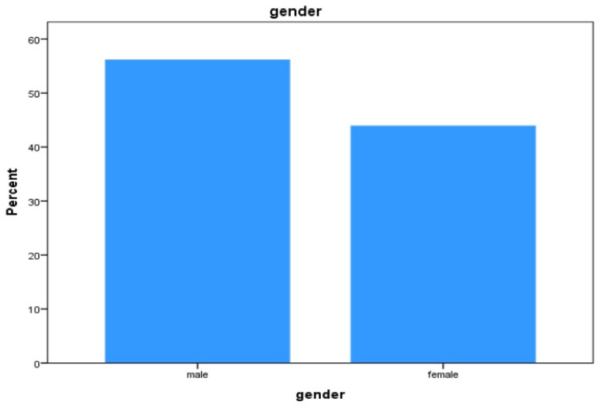

Figure 1: Bar graph showing the gender of the patients who are completely edentulous. X axis showing the gender and Y axis showing the percentage of patients in that gender. About 56% of patients with completely edentulous condition were males and 44% were females. From the graph, it was evident that the highest number of patients with completely edentulous condition were males.

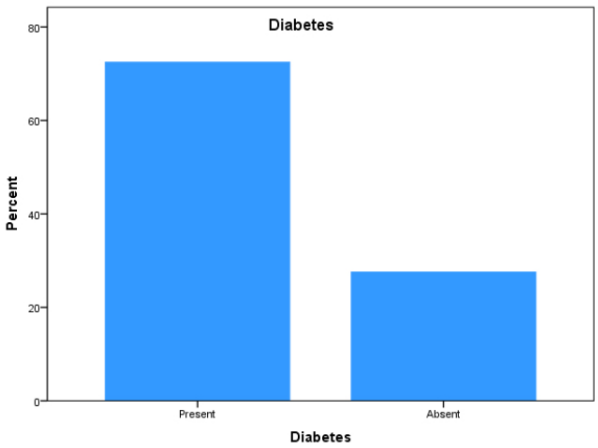

Figure 2: Bar graph showing the incidence of diabetes among the completely edentulous patients. X axis showing the presence or absence of diabetes and Y axis showing the percentage. About 72% of patients with completely edentulous condition were diabetic and 28% were nondiabetic. From the graph, it was evident that the highest number of patients with completely edentulous condition were diabetic.

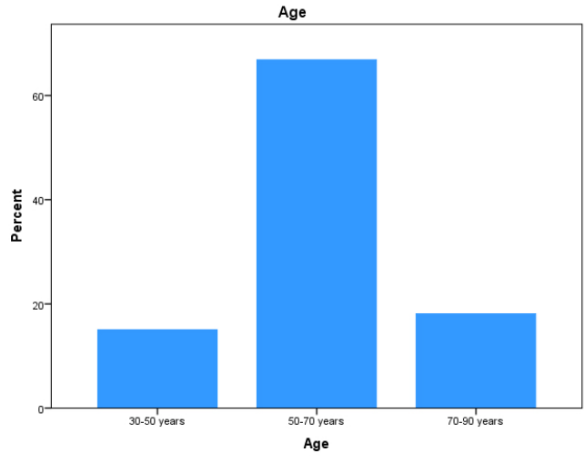

Figure 3: Bar graph showing the age distribution among patients with completely edentulous condition. X axis showing the various age groups and Y axis showing the percentage. From the analysis, it was evident that the highest number of patients who reported with completely edentulous condition were between the age group of 50-70 years.

between the age group of 50-70 years and 14% were found between the age group of 70-90 years of age and 11% were found between the age group of 30-50 years of age (Figures 4 and 5). According to the statistics, the p-value was found to be less than 0.05. Hence, there was a significant correlation between diabetes and completely edentulous condition.

A study by Ladha, et al. [22] stated that there is a significant correlation between diabetes and edentulism. Our study finding states that there is a significant correlation between diabetes and completely edentulous condition. Hence, our study findings are in concordance with the

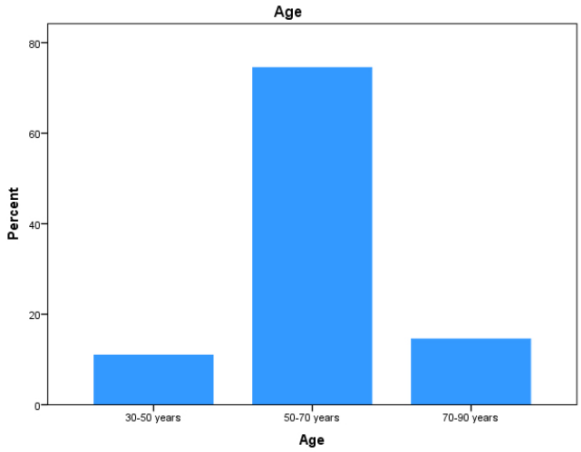

Figure 4: Bar graph showing the age distribution of patients with completely edentulous condition having diabetes. X axis showing the various age groups and Y axis showing the percentage. From the analysis, it was evident that the highest number of patients with diabetes were between the age group of 50-70 years.

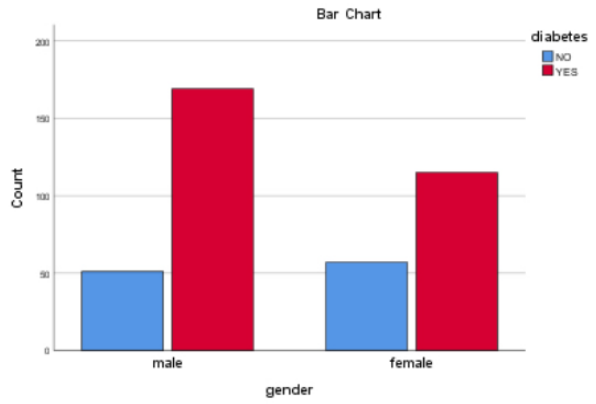

Figure 5: Bar graph showing the association between Diabetes with completely edentulous condition and gender. X axis represents the gender and Y axis represents the number of patients with completely edentulous condition. Here, the red colour denotes the patients with diabetes and blue colour denotes the non-diabetic patients. From the graph, it was evident that the highest number of male patients with completely edentulous condition were diabetic. There is a significant association between the gender and completely edentulous condition with Diabetes (Chi Square test; p value 0.029).

literature. A study by Taboza et al. [31] stated that the edentulous patients presented with higher glycemic levels than the dental groups. Another study by Ikimi et al. [32] stated that the tooth loss is more in diabetic patients than non-diabetic patients. Results of our study are comparable with the results obtained from the literature.

A study by Moore et al. [33] have investigated the effects of insulin dependent diabetes and its correlation with tooth loss and have summarized that the duration of Type 1 diabetes is associated with tooth loss. This result correlates with our present study. A study by Emami et al. [17] stated the prevalence of completely edentulous

condition is more common in age above 60 years. Results of our study (the most common age group is 50-70 years) is comparable with the results obtained from the present study. A study by Hosseini et al. [34] stated that about 55% of patients with completely edentulous condition were found to be male. The results of our study reported that 56% of patients with completely edentulous condition were found to be male. The results obtained from our study are like the results obtained from the literature. A study by Vijay et al. [35] stated that systemic disease, edentulism and nutrition are all interrelated. The results obtained from the present study are similar with the result obtained from the literature.

LIMITATIONS

The correlation between the completely edentulous condition and diabetes is observed with the fact that the subjects examined represent a selected population. Future studies can be done with larger sample sizes and in a varied population.

CONCLUSION

There is a significant correlation between diabetes and completely edentulous condition. So, Medical and dental professionals can improve patient management of oral and overall effects of diabetes by implementing numerous awareness programs regarding dental education and oral health promotion.

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