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INCIDENCE OF DIABETES AMONG TOOTH SUPPORTED FPD PATIENTS IN DENTAL COLLEGE - A RETROSPECTIVE STUDY

K. THIRUMAGAL[1], RAKSHAGAN[2*] AND RAVINDRA KUMAR JAIN[3]

1: Saveetha Dental College & Hospital Saveetha Institute of Medical and Technical Science, Saveetha University162, Poonamallee High Road, Chennai - 600077

2: Senior Lecturer, Department of Prosthodontics, Saveetha Dental College & Hospital, Saveetha University, 162, Poonamallee High Road, Chennai - 600077

3: Associate Professor, Department of Orthodontics, Saveetha Dental College & Hospital, Saveetha Institute of Medical and Technical Science Saveetha University162, Poonamallee High Road, Chennai - 600077

***Corresponding Author: E Mail: Dr. Rakshagan: Rakshagan.sdc@saveetha.com**

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ABSTRACT

The incidence of diabetes mellitus is increasing steadily. The fixed prosthodontics treatment involves the replacement and restoration of teeth by artificial substitutes that are not readily removable from the mouth. Balanced nutrition is essential for the patient with diabetes. The masticatory performance of the dental prosthesis may also affect the nutritional intake of the patient with diabetes. There are several medical and dental management issues that dentists should consider while treating patients with diabetes mellitus. The aim of the study was to find the incidence of diabetes among tooth supported FPDs in a Dental College. A retrospective study was planned with data collection from June 2019 - April 2020 in a university setup. We reviewed the patients records and analysed the data of 86000 patients. The data report includes the details like patient age, gender, medical alert, treatment. The records were manually verified by 2 reviewers and the data was tabulated in the excel sheet followed by statistical analysis was done

using SPSS software (Statistical Product and Service Solution)in IBM with chi square test. Total subject population was 614 and their age group ranged from 18-90yrs, total Males were 338 and females were 276. Out of this Male patients with diabetes were 23 and Female patients with diabetes were 22. And the Male patients without diabetes were 315 and Female patients without diabetes were 254. Therefore males with diabetes were more predominant compared to females with diabetes. And the predominance age group affected by diabetes was seen among (41-50) years of age group.

Keywords: Diabetes, FPD, Replacement, Complication, Statistics analysis, Dental prosthesis

1. INTRODUCTION

Diabetes mellitus is a disorder of fat, glucose along with this there is defect in protein metabolism that will result in impaired secretion of insulin and varying resistance in degree of insulin production or both **[1]**. The diabetes mellitus is a metabolic disorder which is characterized by the hyperglycemia that is due to the defect present in the beta cell of pancreas **[2]**. And chronic hyperglycemia is also associated with various disorders like cardiovascular, peripheral neurological and cerebrovascular disorder. Management of the patients with diabetes must be considered important mainly on the dental disease and the dental treatment is clearly appreciated for the co- morbidities which accompany long standing diabetic mellitus **[3]**. In the world wide there is an expectation that diabetic patients will increase from the present situation 150 million to 220 million in the year 2010 and in the year of 2025 it will reach to 300 million **[4]**.

The dental prosthesis can be divided into two types. One is the fixed dental prosthesis (FPD) and another one is removable dental prosthesis (RPD). The Fixed dental prosthesis will include the tooth supported prosthesis as well as implant supported fixed prosthetic. Which are said to provide masticatory forces that are equal to the masticatory forces that is produced by the natural dentition **[5]**. Proper size teeth are required for achieving a natural denture looking **[6-8]**.

In order to decrease the effect of mechanical complications the pre machined components are used in order to regulate the prosthetic protocols **[9, 10]**. The marginal fit discrepancy will allow the infiltration of salivary and microleakage that will result in luring cement dissolution thus there will be increased susceptibility of caries

simultaneously it can also lead to damage in pulpal **[11, 12]**. Marginal discrepancy indicates severe sensitivity because of exposure to dentinal tubules and that allows the collection of plaque as well as food debris around the margins which are exposed. Eventually periodontal breakdown in abutment teeth is initiated **[13, 14]**. For years the partially edentulous patients are either treated with fixed prosthesis or removable prosthesis. Recently the fixed prosthesis has become more popular compared to the removable prosthesis because of comfort in wearing, function and aesthetics. Fixed prosthesis can also be restored by taking support from adjacent teeth or even by the use of implants **[15-17]**. For the teeth which require crowns or any replacement in the form of fixed dental prosthesis (FPD), the retraction of gingiva has become a mandatory procedure which will help in recording both prepared and unprepared surfaces of the abutment tooth **[18-20]**.

More rapidly diabetes is seen in dental patients and it is always associated with oral health **[21]**. The Diabetes mellitus is known well for the alteration in the qualitative as well as quantitative in the parenchyma of the major salivary glands and that will result in less production of saliva and associated with polyurea. This will result in the fungal infections like candida and various other species that may increase the oral infections. And there can be raised glucose levels in the blood and that can interfere in the function of the vessels and normal defense mechanism leading to an immunocompromised state of an individual **[22]**. The dental caries risk in the diabetic patients gets elevated due to dry mouth known as xerostomia. So there will be a decrease in the buffering activity of the saliva. That can reduce the particular tooth capability to be used as abutment in fixed prosthetic and overdenture fabrication **[23]**. So our study aims to find the incidence of diabetes among tooth supported FPDs patients.

2. MATERIALS AND METHODS

The study setting was basically a university setting. This is because the available data with similar ethnicity was collected from the particular geographic location. The trends in the other location were not assessed in the study setting. Ethical approval was done by the universal ethical committee before the start of the study. We reviewed the patients records and analysed the data of 86000 patients from June 2019- April 2020. The case sheet was manually reviewed and cross verified in order to avoid errors. To minimise the sampling bias all available data was

included and the sorting process was done. Totally 614 Fixed partial denture patients records (patients with and without diabetes) were included. In the particular time was considered as internal validity and a prescriptive pattern was followed to analyse external validity. All the data like the patient's age, gender and medical alert was collected. The data which are obtained were entered in the excel sheet and Tabulated and finally SPSS imported was done including the chi square test.

3. RESULT AND DISCUSSION

In the present study on analysing the data of 614 FPD cases. The age of the patients ranged between (18-90) yrs. Out of 614 FPD patients the Male gender were 338 and female gender were 276. In that Male patients with diabetes were 23(3.75%) and Female patients with diabetes were 22(3.58%). Whereas Male patients without diabetes were 315 (51.30%) and Female patients without diabetes were 254(41.37%). Most of the diabetes patients belong to the age group (41-50) years followed by (51-60) years. On Statistical comparison between age and medical alert (patients with and without diabetes). The p value was 0.000 ($p< 0.001$) therefore there was a significant difference between age and medical alert. And Statistical comparison of association of gender and medical alert (patients with and without diabetes). There was no significant difference in the reasons behind frenectomy between males and females (p value >0.05). Statistical comparison between age and gender; On statistical analysis p value: 0.000 ($p< 0.001$) hence there was a significant difference between age and gender.

In our study the predominant age group affected due to diabetes and has undergone tooth supported fixed partial denture treatment is between (41-50) yrs. But in the (Fatima Kyari et.al 2014) **[24]** study they analysed1595 participants. Out of them 52 of them had diabetes. The prevalence of diabetes was higher in those aged 80 yrs and above and those aged (40-59) years. It is because they belong to the economically active age group and are medically compromised.

The cross sectional studies done by (Bishwajit Bhowik *et al* 2015) **[25]** in rural communities. Stated that Male participants had higher prevalence in diabetes mellitus in 2009. It is because of habits like alcohol that will reduce the body's sensitivity to produce insulin and finally result in diabetes.

In our study patients under the age group (51-60) years are more prevalent in patients without diabetes and there were significant differences between patients age and gender

whereas the study done by (Masayuki Ueno *et al* 2010) **[26]** Stated that 59 year old patients or younger age groups were higher in diabetic than non- diabetes. And in their study the prevalence between males and females did not differ significantly in any age group.

In our study Male patients with diabetes were 23(3.75%) and Female patients with diabetes were 22(3.58%). But in contrast (Mohammed Abdullah *et al* 2019) **[27]** in their study observed that 122(34.6%) respondents had diabetes mellitus. Out of that total 56(34.2%) where males and females are 66(34.9%) affected by diabetes. And 103 (44.6%) of those at least 40 yrs old had diabetes mellitus ($p < 0.001$).

According to our study the male gender has a high prevalence rate of diabetes mellitus compared to the female. And the high prevalence of diabetes was seen among the age group of (41-50) years and followed by (51-60) years because it depends on the economical condition as well as medically compromised.

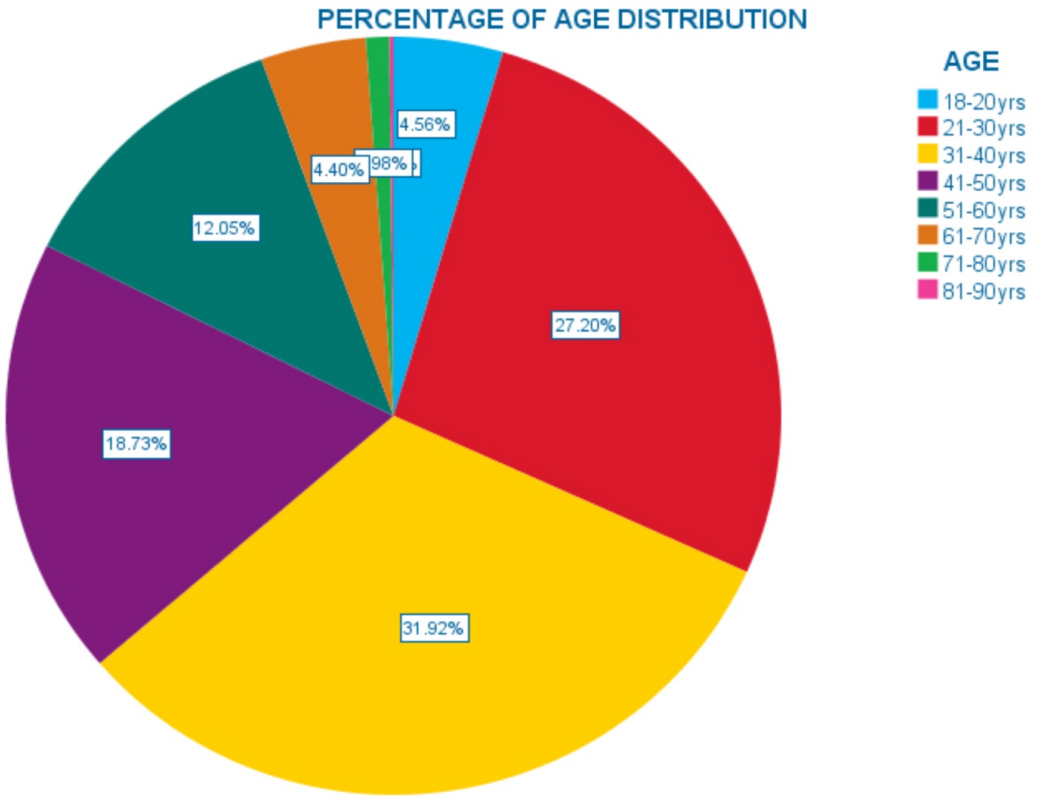

Figure 1: Pie chart depicts the percentage of age distribution. Majority(31.92%) of them belong to the age group 31-40years (yellow). Followed by 21-30 years (red) participated more (27.20%). Then came 41-50 years (purple) were (18.73%), then (12.05%) 51-60 years (dark green), 18-20 years (blue) were (4.56%), 61-70 years (orange) were (4.40%). And at least 71-80 years (light green) were (0.98%) followed by 81-90 years (pink) were (0.16%)

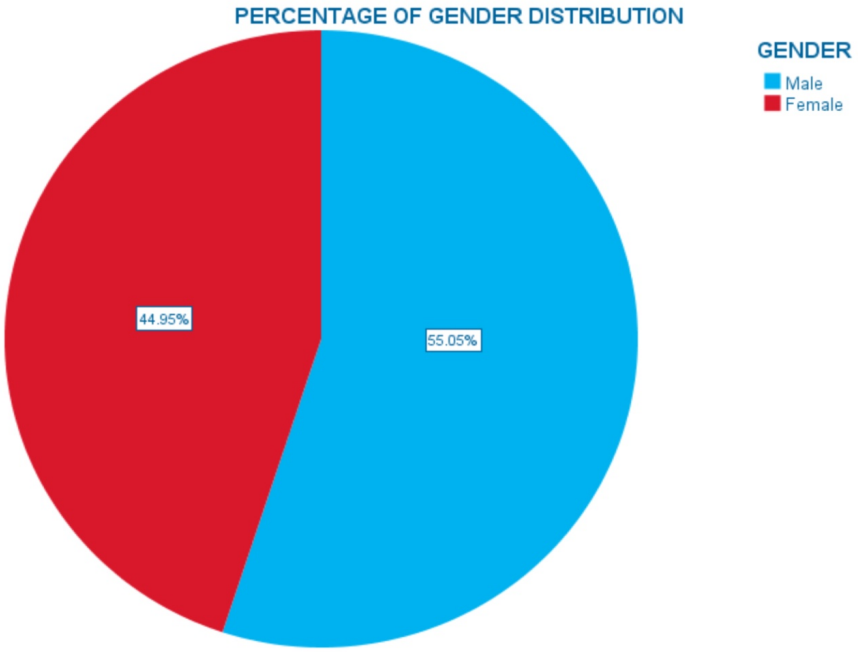

Figure 2: Pie chart depicts the percentage of gender distribution. Male (blue) were 55.05% and Females (red) were 44.95%. This shows the Male participants in our study were more compared to Females.

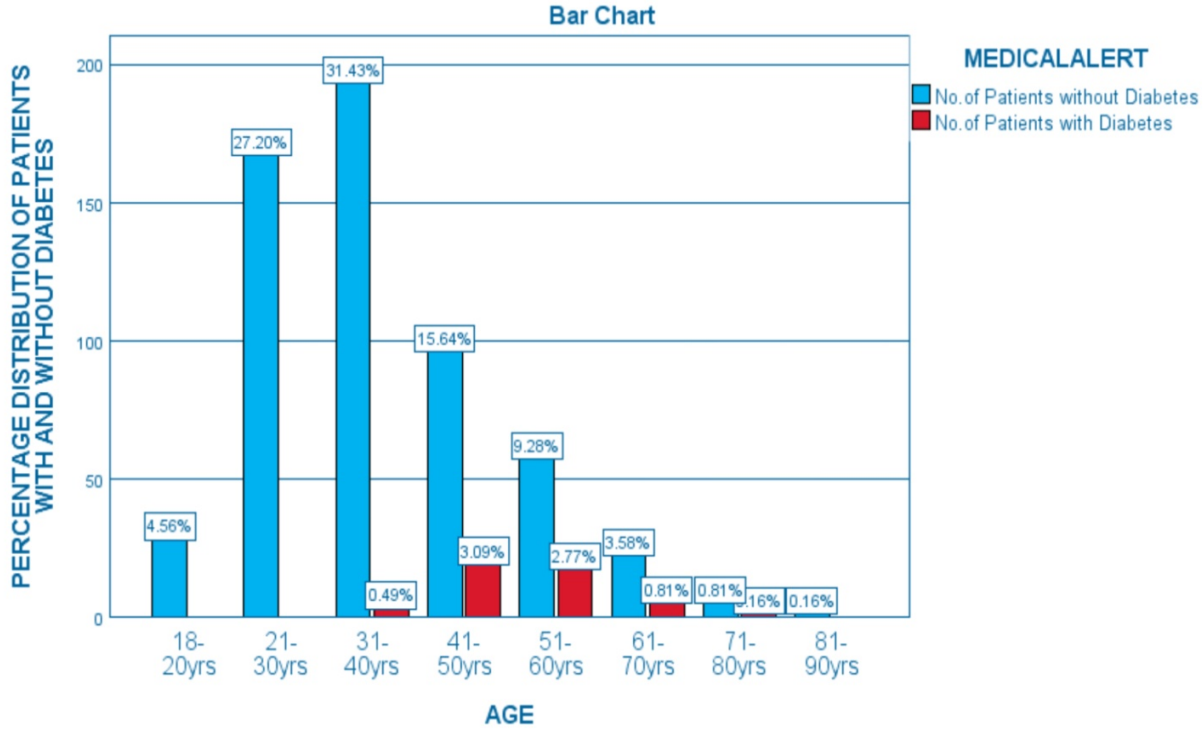

Figure 3: Bar graph represents the association between the age and medical alert (patients with and without diabetes). X-axis represents the age group and Y- axis represents the medical alert (No. of patients with and without diabetes). Chi-square test was done and association was found to be statistically significant [Pearson's Chi Square value:71.924, DF: 7, p value: 0.000 (p< 0.001)]. Therefore statistically significant, proving that high prevalence of diabetes was seen under the age group (41-50)years followed by (51-60)years.

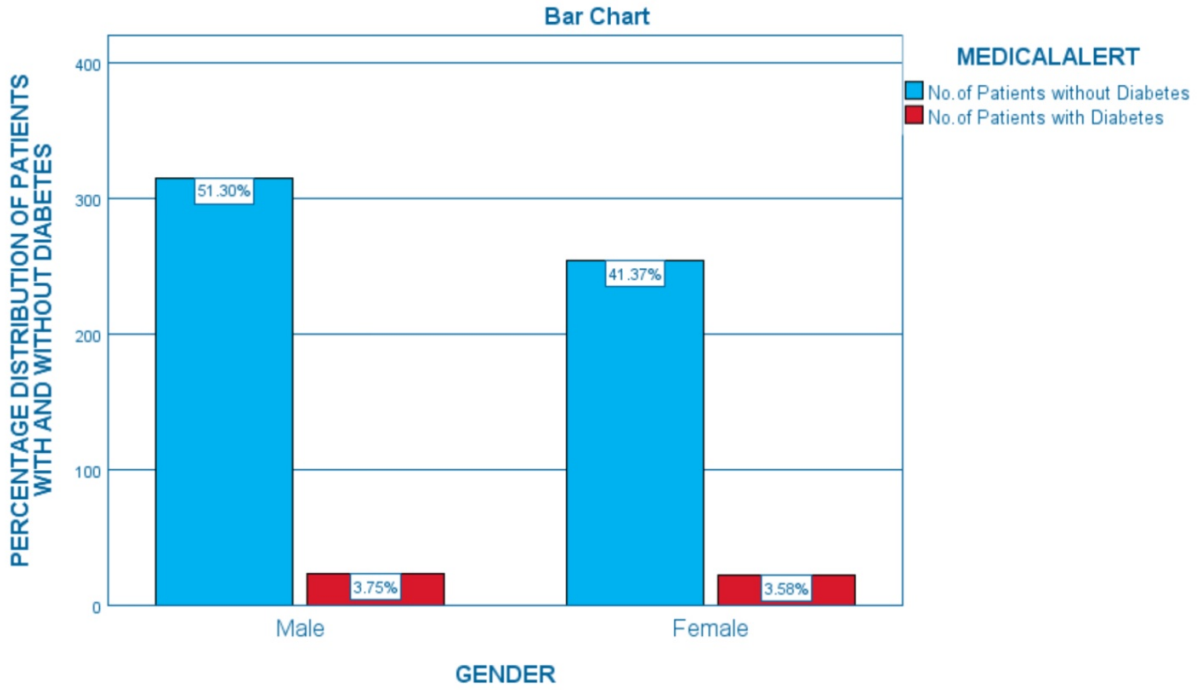

Figure 4: Bar graph represents the association between the gender and medical alert (patients with and without diabetes). X- axis represents the gender and Y- axis represents the medical alert (No. of patients with and without diabetes). Chi-square test was done and association was not found to be statistically significant [Pearson's Chi Square value:0.304, DF: 1, p value: 0.581 (p>0.05)]. Even Though it is statistically insignificant, the majority of patients without diabetes was seen in both Male and female gender compared to patients with diabetes.

4. LIMITATIONS

There are certain limitations in our study. There is a small sample size used which cannot be generated for a large population. And the study doesn't represent the ethnic group and population.

5. FUTURE SCOPE

The study should be done in a larger population. Multicentered study should be done including other criterias.

6. CONCLUSION

According to the present study, we found that a high prevalence of diabetes was seen in males compared with that of females. And a high prevalence of diabetes was seen among the age group of (41-50) years and followed by (51-60) years compared to females. But on comparing FPD patients with diabetes and without diabetes. The prevalence of FPD patients with diabetes was comparatively less than FPD patients without diabetes. In the future, this study can be done with a large population and other systemic diseases can also be included in the study

7. CONFLICT OF INTEREST

Nil; Conflict of interest

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