

COMPARISON OF DENTAL CARIES STATUS OF TYPE-2 DIABETICS WITH NON-DIABETICS

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ABSTRACT

Objectives: To determine the association of type-2 Diabetes Mellitus with dental caries by using decayed, missing and filled teeth index.

Study Design: Case control study.

Place and Duration of Study: Out-patient department of operative dentistry at Armed Forces Institute of Dentistry, Rawalpindi for one year.

Material and Methods: Age, gender and oral hygiene matched, 50 type-2 diabetics and 50 non-diabetics individuals, of 30 to 50 years of age were enrolled for the study. The Decayed, Missing and Filled teeth (DMFT) scores were assessed and recorded on proforma.

Results: The difference in DMFT scores of type-2 diabetics and non-diabetics is statistically non significant, ($p=0.294$).

Conclusion: Type-2 diabetes mellitus was not significantly associated with higher DMFT, so there is no difference in frequency of dental caries in type-2 diabetics and non-diabetics.

Keywords: Dental caries, Decayed, Missing and Filled teeth index, Type-2 Diabetes Mellitus.

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INTRODUCTION

Diabetes mellitus is a syndrome of persistent hyperglycemia due to absolute or relative deficiency of insulin leading to its related complications, morbidity and mortality¹. Type-2 or non-insulin dependent diabetes mellitus (NIDDM) approximately accounts 95% of all cases of diabetes². It is one of the most prevalent diseases of civilized world and it has become a major health problem in Pakistan³.

Diabetic patients are at more risk of greater accumulation of plaque, increased incidence and frequency of dental caries^{4,5}. There are reports of xerostomia, altered immune response to infection, microvascular changes and possible increase in glucose concentration of saliva in uncontrolled diabetes mellitus. When the normal environment of the oral cavity is altered, a healthy mouth can become susceptible to dental caries and other oral diseases like gingivitis, periodontitis, candidiasis, lichen planus and oral

paresthesia including burning mouth syndrome and altered taste sensation⁶⁻⁸.

In the region where the number of patients with diabetes mellitus is growing day by day it is imperative to investigate the association of diabetes with dental caries and tooth loss, if adverse effects of diabetes on dental caries and/or tooth loss are substantiated, the results of such studies would help to design interventions and to prevent or reduce the occurrence of dental caries and tooth loss in people with diabetes.

PATIENTS AND METHODS

This case control study was carried out at department of operative dentistry at Armed Forces Institute of Dentistry (AFID) Rawalpindi for one year. One Hundred patients, 50 diabetic patients (case group) and 50 healthy subjects (control group) matched for age, gender and oral hygiene were included through consecutive (non-probability).

Physician diagnosed diabetics at least for last one year and non-diabetic patients reporting at AFID for regular checkup. Both genders between the ages 30-50 years were included in the study.

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Patients using any medication other than medications used for diabetes with smoking history, history of radiation therapy of head and neck region, tooth loss due to trauma or orthodontic treatment and fissure sealed teeth were excluded.

The patients were informed about the study and after they fulfilled the inclusion criteria, informed consent for participation in the study was taken, the type-2 diabetic subjects (n=50) were enrolled from patients visiting the Armed Forces Institute of Dentistry, Rawalpindi. For each type-2 diabetic patient recruited in the study, age, gender and oral hygiene matched non-diabetic counterpart (n=50), were enrolled from consecutive subjects visiting Armed Forces Institute of Dentistry, Rawalpindi, for regular checkups and were placed in group B. Oral hygiene was matched by using oral hygiene index (Greene and Vermilon 1960)⁹.

Decayed, missing and filled permanent tooth surfaces were assessed in the out patient department of operative dentistry at Armed Forces Institute of Dentistry. A consistent and systematic approach for each dental examination was adopted. In both groups, the same examination procedures were followed by the similar examiner for all patients. Examination was performed in dental chair under good light, using a plane mouth mirror, sickle explorer. All the data was recorded on a proforma and filled during history taking and examination.

All the data was entered in SPSS version 20.0 for analysis. Mean & standard deviation was calculated for age. Frequencies and percentages were presented for gender and DMFT (categorized). Chi-square test was applied to compare the diabetic and non diabetic group for DMFT (categorized). A *p*-value ≤ 0.05 was considered statistically significant.

RESULTS

100 subjects were enrolled in the study, out of which 50 (50%) were type-2 diabetics and 50 (50%) were non-diabetics. In type-2 diabetic group 29 (58%) were males and 21 (42%) were females. In non-diabetic group 29 (58%) were

males and 21 (42%) were females. In each group the age of subjects ranged from 30 to 50 years, with mean age of 41.34 years \pm 4.50 (table-I).

In the type-2 diabetic group 64% patients had DMFT score in the range of 0-5, 24% patients had DMFT score ranging from 6-10 and 12% patients had DMFT in the range of 11-15.

In non-diabetic group 58% patients had DMFT in the range of 0-5, 34% patients had DMFT score ranging from 6-10, and 8% patients

Table-I: Mean Age of the patient in total sample.

| Study variables | n | Mean (SD) |
|------------------|----|--------------|
| Type-2 Diabetics | 50 | 41.34 (4.51) |
| Non-Diabetics | 50 | 41.34 (4.51) |

p=1.00

Table-II: Type-2 Diabetics / Non Diabetic decayed missing and filled teeth cross tabulation.

| Study Groups | DMFT 0-5 | DMFT 6-10 | DMFT 11-15 |
|------------------|----------|-----------|------------|
| Type-2 Diabetics | 32 % | 12% | 6% |
| Non-Diabetics | 58% | 35% | 7% |

p-value=0.294

had DMFT score in the range of 11-15. The difference in DMFT scores of type-2 diabetics and non diabetics is statistically in significant, (*p*=0.294) (table-II).

DISCUSSION

A relationship between dental caries and type-2 diabetes has strong biological foundation, but there is only limited clinical and epidemiological support for such an association. The International literature, however presents few studies but these attempts have produced conflicting results and mostly unequivocal conclusions, like studies by Hintao and associates¹⁰, Hernandez-Laguna and associates¹¹, Arrieta-Blanco (2003) and associates¹², Lopez-Perez *et al.* (1996)¹³, and Pohjamo *et al.* (1991)¹⁴, did not find any difference in caries prevalence between type-2 diabetics and controls. The finding of the present study are consistent with the above mentioned studies and does not support the assumption that type-2 diabetics are at higher risk of developing dental caries. However there are several publications where a positive association between

type-2 diabetes and dental caries has been reported. Like Sandberg *et al.*¹⁵ Albrecht *et al.*¹⁶ and Jones *et al.*¹⁷ reported that, the diabetic population suffered from higher rates of caries than normal individuals.

Two factors are largely responsible for this current lack of consensus. First, both type-2 diabetes mellitus and caries are chronic conditions with variable presentations and complex etiologies which complicate attempts to study them. Second, most reported studies have been of cross sectional design and have involved small, non representative samples¹⁸. The discrepancies between the different publications can further be explained by difference in study populations, changes in caries prevalence over time and methodological differences to assess the relationship of diabetes and dental caries.

In a survey by WHO, it is estimated that, Pakistan will have approximately 14.5 million people affected with this disease in the year 2025 and will be 4th on the list worldwide¹. Hence, a prospective cohort study of diabetics and its relation with dental caries and oral diseases is recommended for this region in future research for further enhancing our knowledge of the associations between these two complex diseases.

CONCLUSION

In our study difference in caries experience between type-2 diabetics and non-diabetics was statistically insignificant; hence this study does not support the assumption that there is difference in frequency of dental caries in type-2 diabetics and non-diabetics. However, the subject will remain open until more wide-ranging longitudinal studies are performed.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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