

COMPARISON OF DENTAL CARIES AND PERIODONTAL HEALTH AMONG ADULT DIABETIC & NON – DIABETIC POPULATION OF MORADABAD

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ABSTRACT

To assess comparison of dental caries and periodontal health among adult diabetic & non – diabetic population of moradabad. A multi-phase simple random sampling technique used to survey in Moradabad city. Estimated sample size 500 patients i.e. 250 were Diabetic and 250 are Non- diabetic. A Type III clinical examination was carried out. Chi-square test was used to compare the proportion and mean values were compared using student t- test. ANOVA Was used for the group comparison and statistical analysis was done using SPSS version 15.0. The mean DMFT was 2.40 in Diabetic and 2.19 in Non-Diabetic. Statistically, the difference between two groups was significant ($p < 0.05$). For all the sextants as well as for cumulative assessment, mean CPI of diabetics was higher as compared to non-diabetics. The difference between two groups was also significant statistically for all the sextants. As compared to non-diabetics, diabetics had higher mean LOA values. Statistically, the difference between two groups was significant ($p < 0.05$). We conclude diabetics have an increased incidence of caries and the result of this study suggest that diabetes contributes to severity of periodontal disease.

KEY WORDS

Dental Caries, Periodontal Health, Diabetic, Non- Diabetic.

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INTRODUCTION

Health is an invaluable asset. An understanding of health is the basis of all health care.¹ Oral self care as part of general health self care has clearly shown its importance in the prevention of oral disease such as periodontal disease and caries.^{2,3} Diabetes mellitus is a syndrome of abnormal carbohydrate, fat & protein metabolism that results in acute and chronic complications due to the absolute or relative lack of insulin. Diabetes is classified as: Type 1 and Type 2. Diabetes mellitus currently is the leading cause of death in the world. On of the leading complication of diabetes periodontitis, is in infection of the periodontal support tissues.⁴ Periodontitis & diabetes have bidirectional relationship. There is an interacting, complex relationship between Diabetes and periodontitis. Many studies have shown a greater incidence and a greater severity of periodontitis in diabetic patient.^{5,6} periodontal disease can lead to recession of the gingival margin, which can expose more tooth surfaces to caries attack. Due to hyposalivation may resulting in minimizing buffer activity which promotes remineralization of the tooth structures early in caries process. The prevalence of diabetes mellitus has risen dramatically in recent years, resulting in a rapid increase of diabetic patients. Asia in particular has the highest prevalence of diabetes in the world. Among various risk factors for periodontitis, diabetes has been confirmed as a major risk factor.^{7,8} The prevalence of periodontitis is higher and its symptoms are more severe in individuals with diabetes, compared with non-diabetics.^{7,9,5} Therefore the aim of the study Comparison Dental Caries, Periodontal Health among adult Diabetic and Non-Diabetic population of Moradabad.

MATERIALS AND METHODS

The present study was undertaken to assess the comparison of Dental Caries and Periodontal Health among adult Diabetic & Non-Diabetic Population of Moradabad city. The study was reviewed and cleared by the Institutional Ethics and Review Board of Kothiwal Dental College and Research Centre,

Moradabad. A multi- phase simple random sampling technique was incorporated for the 500 patients i.e. 250 were Diabetic patients and 250 are Non-diabetic.

● **Inclusion Criteria:**

1. Patients having random blood sugar between 200-300 mg/dl & willing to participate in the study.
2. All the diabetic patients present in the hospital on the day of examination & gave consent were included in the study.
3. Patient those are taking only oral medication for diabetes.
4. Non-diabetics patients (Control Group) were selected from the individuals accompanying the patients (i.e. Attendants, Relatives, Friends, Spouse etc.) and who were matched by age and sex & having random blood sugar less than 200 mg/dl (ACU-Check Active).

5. Subjects were having minimum number of 16 functional teeth in the oral cavity.

● **Exclusion Criteria:**

1. Patient having random blood sugar more than 300g/dl.
2. Patients having any other systemic disease other than Diabetes Mellitus.
3. History of systemic antibiotic administration with in the last 3 months.
4. Patient had undergone any periodontal treatment with in last 6 months.

Type III examination was carried out with Mouth mirror, explorer and CPI probe under natural light using WHO Dentition status, Community Periodontal Index and Loss of Attachment.

Table 1: Comparison of Mean Decayed, Missing and Filled teeth between diabetic and non-diabetic population

SN	Variable	Diabetics (n=250)		Non-Diabetic (n=250)		Significance of difference	
		Mean	SD	Mean	SD	“t”	“p”
1.	Decayed	1.72	1.07	1.58	0.89	1.501	0.134
2.	Missing	0.06	0.38	0.05	0.58	1.759	0.079
3.	Filled	0.62	0.98	0.56	1.11	4.694	<0.001
4.	DMFT	2.40	1.25	2.19	1.30	2.883	0.004

Table 2: Comparison of Sextant wise Mean CPI between diabetics and non-diabetics

SN	Sextant	Diabetics (n=250)		Non-Diabetic (n=250)		Significance of difference	
		Mean	SD	Mean	SD	“t”	“p”
1.	17/16	2.00	1.34	1.68	1.24	-2.740	0.006
2.	11	1.10	0.92	0.84	0.83	-3.318	0.001
3.	26/27	1.52	1.18	1.51	1.10	-0.078	0.937
4.	37/36	2.02	1.21	1.62	1.19	-3.688	<0.001
5.	31	1.42	0.84	1.15	0.86	-3.477	0.001
6.	46/47	1.87	1.26	1.50	1.00	-3.660	<0.001
7.	Cumulative CPI	2.97	0.93	1.76	1.18	-12.833	<0.001

Table 3: Comparison of Sextant wise Mean LOA between diabetics and non-diabetics

SN	Sextant	Diabetics (n=250)		Non-Diabetic (n=250)		Significance of difference	
		Mean	SD	Mean	SD	“t”	“p”
1.	17/16	1.10	1.02	0.98	0.87	1.418	0.157
2.	11	0.12	0.38	0.14	0.39	-0.584	0.559
3.	26/27	0.21	0.43	0.20	0.40	0.323	0.747
4.	37/36	0.37	0.61	0.24	0.53	2.562	0.011
5.	31	0.08	0.27	0.11	0.32	-1.214	0.225
6.	46/47	0.62	0.75	0.46	0.68	2.436	0.015
7.	Cumulative LOA	1.55	0.84	1.36	0.75	2.642	0.008

Table 1: Comparison of Mean Decayed, Missing and Filled teeth between diabetic and non-diabetic population- Mean number of decayed, missing and filled teeth in diabetics were 1.72 ± 1.07 , 0.06 ± 0.38 and 0.62 ± 0.98 respectively. Mean DMFT of diabetics was 2.40 ± 1.25 . Mean number of decayed, missing and filled teeth in non-diabetics were 1.58 ± 0.89 , 0.15 ± 0.78 and 1.06 ± 1.11 respectively. Mean DMFT was 2.73 ± 1.30 . As compared to diabetics, non-diabetics had higher mean value for decayed, missing and filled teeth separately as well as for combined DMFT. Statistically, the difference between two groups was significant for filled teeth and DMFT ($p<0.05$).

Table 2: For all the sextants as well as for cumulative assessment, mean CPI of non-diabetics was higher as compared to diabetics.

Table 3: Comparison of sextant wise mean loa between diabetics and non-diabetics- As compared to non-diabetics, diabetics had higher mean LOA values for sextant 17/16, 26/27, 37/36, 46/47 and overall LOA whereas non-diabetics had higher mean value as compared to diabetics for sextant 11 and 31. Statistically, the difference between two groups was significant for sextants 37/36 and 46/47 and overall LOA scores ($p<0.05$).

DISCUSSION

Diabetes mellitus (DM) is a chronic, non-communicable disease and also one of the major global public health issues. It is defined as a clinical syndrome characterized by hyperglycemia due to the defect in insulin secretion by pancreatic β cells, a

decrease in insulin sensitivity, or a combination of both. There are many reports in the literature concerning the influence of diabetes on oral health. In the present study an attempt was done to assess and compare the oral health status of diabetic and non-diabetic population of Moradabad. The clinical results of the present study indicate an increased vulnerability to dental caries in patients with diabetes compared with non-diabetic individuals. Dental caries is an infectious disorder involving multiple factors that coincide at a given point and at a given time. The basic factors are the presence of the causal microorganism, the host (tooth), substrate (diet) and immune capacity of the patient. The microorganisms associated with dental caries were studied by Twetman et al.¹⁰ in diabetic patients. These authors reported a high proportion of *Streptococcus mutans* in the aerobic flora of the oral cavity. Other authors^{11,12} have reported a decrease in the presence of salivary lactobacilli, due to the diet prescribed in such patients. In contrast, other authors such as Iughetti et al.¹³ have observed similar counts of *Streptococcus mutans* and lactobacilli in diabetic and non-diabetic patients. Increased bacterial plaque aggregation has also been related to the saliva of these patients.¹⁴

In the present showed that diabetics had higher mean LOA values for sextant 17/16, 26/27, 37/36, 46/47 and overall LOA whereas non-diabetics had higher mean value as compared to diabetics for sextant 11 and 31. Statistically, the difference between two groups was significant for sextants 37/36 and 46/47 and overall LOA scores ($p<0.05$).

Current emphasis is on evaluating risk factor for periodontal diseases. Majority of studies done throughout the world suggest that diabetes is a risk factor for periodontitis while some have failed to establish the relation. Continuing discussion on possible relation between diabetes and periodontitis

and inability to find a clear cut relation is due to complex nature of both the diseases and changing criteria over the years used to define the two entities making comparison difficult. Relatively high prevalence of both diseases in population makes it difficult to conduct large enough studies with enough statistical power to provide reliable data.

CONCLUSION

Diabetic patients were affected by severe degree of periodontal disease manifested as deep and shallow pockets while among non-diabetics more number of patients were affected by the relatively lower degrees of disease manifested as bleeding calculus and shallow pockets. Loss of attachment was more in diabetics than non-diabetic and periodontal disease was more severe with poor oral hygiene. The Decayed, Missing and Filled component was more in diabetics as compared to non-diabetics. The result of this study suggest that diabetes contributes to severity of periodontal disease and illustrate the need for preventive programmes and services for diabetic community, tailored to improve their glycemic control which contributes to prevention of long term complications of periodontal disease associated with diabetes. Since diabetes is considered to be one of the risk factors for periodontal disease and complications of diabetes mellitus have devastating effects on the patient's life and health budget, prevention and control of diabetes seems to be the best result. For greatest success in reducing the incidence and prevalence of diabetic, both high risk approach and a population approach are needed.

Further studies are required in the field of diabetes mellitus as it is one of the most common disorders of modern time that is increasing in epidemic proportions throughout the world including India and remains unique in nature because of its multisystem ramifications.

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