

# Correlation between age and diabetes mellitus-clinical study

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## ABSTRACT

### Problem

Controversial results with diabetes mellitus associated periodontal diseases in patients reported hospital.

### Design

collection of blood sample for determining blood glucose level from patients reported to the department of dentistry and correlate with periodontal diseases by periodontal disease index

### Findings

The relationship between diabetes mellitus and periodontal disease is well documented From the available data, it seemed reasonable to believe that diabetics were more susceptible to periodontal disease than non.diabetics.

### Conclusion

Periodontal disease is more prevalence in diabetic patients and severity increase with age.

## INTRODUCTION

Periodontitis is a common chronic inflammatory disease characterized by the destruction of the periodontal tissues and resulting in the loss of connective tissue attachment. In fact, aggressive periodontitis is recognized as the sixth complication of diabetes, the other five complications are retinopathy, neuropathy, nephropathy, cardiovascular disease and peripheral vascular disease.<sup>1,2</sup> Periodontitis occur in childhood, adolescence, and early adulthood but the prevalence of periodontal disease, tissue destruction and tooth loss increases with age.<sup>3</sup>

The factors such as immediate environment of the periodontium and systemic factors, resulting from the general condition of the patient are responsible for the periodontal disease Apart from age. Diabetes mellitus deserves a special consideration in any comprehensive text of periodontal diseases. Diabetes mellitus affects many people, as does periodontitis, and is found with increasing frequency as people get older as is periodontitis.<sup>4</sup>

A group of metabolic diseases called as Diabetes mellitus (DM) and characterized by hyper- glycaemia caused by defects in insulin secretion, insulin action or both.<sup>5</sup> Another important aspect of this disease is the high morbidity and mortality it produces. Chronic hyperglycaemia, the main characteristic of badly managed DM is associated with a wide range of acute and chronic complications that can affect all the body's organs and systems, including the gingival and periodontal tissues.<sup>6,7</sup> It affects 2 to 10% of the human population.<sup>5</sup> However, there is no unanimity about the exact relationship between diabetes mellitus and occurrence of periodontal disease. Opinions still differ regarding the correlation of diabetes and periodontal disease. In one study it was reported increased severity of periodontal disease in diabetics not related to increased local irritants. According to them angiopathy, abnormal collagen metabolism, abnormal polymorphonuclear cell (PMN) function and altered sulcular microbial flora are found in close association with the severity of periodontitis in diabetic patients. These factors reduce the defensive capacity of tissues and may disturb the tissue response to local irritants.<sup>8-11</sup> In another study authors recognizes no relationship between diabetes and periodontal disease and maintains that, when two conditions exist together, it is a coincidence rather than a specific cause and effect relationship. According to them, the distribution and severity of local irritants affect the severity of periodontal disease in diabetics.<sup>12-16</sup>

The different opinion about the cause and effect relationship between diabetes and periodontal disease, provoke me to carry out the study on patient population and applying various periodontal parameters and diabetic variables.

## **Objectives**

The study was undertaken in diabetic patients with the following objectives.

1. To find out prevalence and severity of periodontal disease.
2. To determine age influence on the prevalence and severity of periodontal disease.

## **MATERIALS AND METHODS**

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A total of 700 patients of both the genders and aged between 20 to 60 years and above were selected on OPD basis in Maharaja Agersain multispecialty hospital, Delhi after getting permission from concerned authority. Patients were selected on the basis of predetermined inclusion and exclusion criteria.

Inclusion criteria of pts:-

1. Under treatment or had diabetes mellitus diagnosed for at least last one year or more.
2. Not having any other systemic diseases.
3. Not having any history of diabetic complications like neuropathy, nephropathy, retinopathy etc.
4. Not using drugs such as phenytoin, nifedipine etc.
5. Not undergone any periodontal treatment since last one year.
6. Willingness to participate in the study.

The relevant history was recorded for all the patients. A careful oral examination was carried out with the help of mouth mirror and graduated periodontal probe. Ramfjords periodontal disease index having components for plaque, calculus and disease severity were recorded for each patient.

### **Procedure for collection of blood sample for determining blood glucose level**

In all the patients, venous blood was collected under strict lab discipline, after an overnight fast and one and half hour after meal. The fasting and postprandial blood glucose levels were determined by autoanalyzer.

### **RESULTS**

Out of 700 patients, 4.4% of patients had insulin-dependent diabetes mellitus (IDDM) and 95.6% had non-insulin-dependent diabetes mellitus (NIDDM). The collected data was analyzed statistically. Karl Pearson correlation coefficient analysis was used to investigate the relationship between prevalence and severity of periodontal disease and various other factors such as age, sex, glycemic status, and duration of diabetes mellitus. Out of 700 patients, 351 were male and 349 were female. The age range of the patients was 20 years to 76 years with a mean age of  $53.24 \pm 11.91$  years. The patients were classified into five groups as shown in table. 1.

**Table 1: distribution of patient according to age and sex**

Groups	age groups	Male patients	Female patients
GroupI	20-30	11	10
GroupII	31-40	29	22
GroupIII	41-50	41	45
GroupIV	51-60	120	125
GroupV	60 &above	150	147
Total population	700	351	349

**Table 2: severity of periodontal disease according to age groups**

Group	age groups	severity
GroupI	20-30	0.42+0.50
GroupII	31-40	2.10+1.63
GroupIII	41-50	3.18+1.42
GroupIV	51-60	3.24+1.42
GroupV	60 &above	4.01+1.91
Total population	700	3.52+1.96

## DISCUSSION

The prevalence of diabetes has been increase with age. Systemic disorder can modified severity of Periodontal disease, one of such systemic conditions playing an important role in etiology of periodontal disease is diabetes mellitus.<sup>17</sup>

In the present study had very small percentage (4.4%) of IDDM patients and 95.6% NIDDM apatients. The present study had also demonstrated that as age of the diabetic pateintt increases, the prevalence and severity of periodontal disease increases. These results are in line with a study by Eke et al. that confirmed a high prevalence of periodontitis in US adults aged 30 years and older.<sup>18</sup> Nanaiah et al. (2013) reported that only 1.5% of 1100 subjects (15-18 years old) suffered chronic periodontitis, moreover the author stated that the presence of gingivitis started to increase in adolescence (16 years old).<sup>19</sup> This distribution of chronic gingivitis and periodontitis shows there is a tendency for periodontal diseases to increase in severity in the older age group, matching the results of previous studies. The increased severity of periodontal disease is not caused by a damage rate increase in periodontal tissues, but rather caused by an accumulation of the damage in periodontal tissues.<sup>20</sup> Moreover, with aging, oral epithelial cells have reduced mitotic activity and metabolic rate. It is assumed that this condition will lead to an impaired immune system and make a patient more susceptible to bacterial infection. General deterioration in immune functions and tissue integrity in older age may serve as a hypothesis for the weakness of periodontal disease.<sup>21</sup>

## CONCLUSION

Following inferences are drawn from the present study:

1. The prevalence as well as severity of the periodontal disease increased with increase in age
2. The prevalence and severity of periodontal disease was significantly correlated to Duration of diabetes mellitus.

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