CLINICAL FORMS OF PERIODONTAL DISEASE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

Cringuta Paraschiv*, Catalina Covalea, Elena Miron, Rodica Ghiuru, Irina Esanu
Paloma Manea, Cristina Maria Gavrilescu
Internal Medical Clinic, Clinical Hospital CF Iasi, Romania, University of Medicine and Pharmacy "Gr. T. Popa" - Iasi, Romania

*Corresponding author: Cringuta Paraschiv, DMD, PhD
University of Medicine and Pharmacy "Gr. T. Popa"
- Iasi, Romania
e-mail: cringutaparaschiv@yahoo.com

ABSTRACT
Background: Although several studies have been reported a higher prevalence of periodontal disease in patients with diabetes, many of these researches must be carefully evaluated because different ways to define diabetes were used as well as various periodontal parameters. Objective: The study evaluated the prevalence and the severity of periodontal disease in diabetic patients according to the duration of the diabetes, type of treatment and the presence of complications. Methods: We conducted a prospective study on 78 patients admitted in CF Hospital Iasi, 48 diabetics and 30 nondiabetic, who received a dental evaluation. Results: Periodontal disease is more severe in diabetic patients and is frequently associated with other diabetic complication. Metabolic control is an important variable in the onset and progression of periodontal disease. Conclusion: Prevention and early diagnosis of periodontal disease in diabetic patients may be extremely important in order to prevent large and irreversible alveolar bone losses.

Keywords: Diabetes mellitus, periodontal disease, gingivitis, glycosylated haemoglobin.

INTRODUCTION
Periodontal diseases and diabetes mellitus, highly prevalent chronic diseases in general population seems to be frequently associated and they are influence each other. (1). Epidemiologic studies in diabetic adults reveal strong evidence that the prevalence of periodontitis is high even at a young age (2,3). In addition periodontal diseases can influence the metabolic state in diabetic patients (4,5). However many researches must be evaluated with caution because different ways to define diabetes were used as well as various periodontal parameters. (6)

Objectives
The purpose of this study was to evaluate the interrelation diabetes-periodontal disease by analyzing the periodontal status in a group of patients with type two diabetes. We have also investigated if there is any correlation between the duration of the diabetes, the type of treatment received and the presence of the usual chronic complications and the periodontal disease severity.

MATERIAL AND METHODS
To achieve our purpose we conducted a prospective study in October 2012 - May 2013 on 78 patients admitted to the CF Hospital Iasi, Clinic of Internal Medicine and Geriatrics-Gerontology. The study group was formed from 48 patients who were diagnosed based on the repeatedly elevated blood glucose levels > 126 mg / dl. They were analyzed according to the duration of the disease, blood glucose levels and
glycosylated haemoglobin, undergoing treatments, the presence or absence of complications. The study group was compared with 30 patients hospitalized with other medical conditions than diabetes such as angina, hypertension, kidney stones, chronic bronchitis or rheumatic conditions.

All the patients were consulted in the dental cabinet of CF Policlinic using the dental consultation kit (dental mirror, dental probe and dental clamp). The diagnosis of various forms of periodontal disease was based on clinical and laboratory signs acquired from the subjects: changes in colour and texture to the gums (red-violet, soft consistency), gingival bleeding, spontaneous or provoked pain when brushing, gingival retraction, periodontal pockets of various depths, bone lysis observed on X-ray. The two groups were comparable regarding age, sex distribution, level of oral hygiene (assessed by questionnaires), the percentage of smokers and obese patients.

RESULTS AND DISCUSSIONS

In all 78 patients was examined the oral cavity evaluating the degree of periodontal disease, such as chronic bacterial gingivitis, superficial and deep chronic marginal periodontitis. In the study group almost all patients, 46, respectively 95.83% had various types of periodontal disease, while in the control group only 11 of the 30 non-diabetic patients, respectively 36.66% had periodontal diseases. The following forms of periodontal disease were diagnosed in the diabetic patients: 6 (13.04%) patients with chronic bacterial gingivitis, 13 (28.26%) patients with chronic superficial marginal periodontitis, 27 (56.25%) patients with chronic profound marginal periodontitis. In the control group 54.54% had chronic bacterial gingivitis, and only 18.13% had chronic profound marginal periodontitis.

In order to assess whether there are correlations between the severity of the diabetes and the presence of periodontal disease, we evaluated in the study group the duration of evolution of diabetes, the presence of complications and the forms of the periodontal disease.

Diabetes age plays an important role in the emergence of various forms of periodontal disease: gingivitis occurred in patients with diabetes age under 5 years at a rate of 80%, while chronic profound marginal periodontitis is predominant in those with diabetes older than 10 years, at a rate 76%. (p<0.05). The patients with diabetes age between 5 and 10 years have shown all forms of periodontal disease.

Several clinical trials have been demonstrated the importance of adequate glycemic control in order to prevent or to delay the progression of chronic complications of diabetes, to reduce the risk of cardiovascular events and general mortality. Blood sugar levels in diabetic patients should be maintained through hypoglycemic diet and medication close to the normal values. A more objective evaluation of glycemic control is achieved by determining glycosylated hemoglobin.

Multiple measurements of blood glucose
levels were done in all diabetic patients. The average values of fasting glucose were between 101 and 349 mg / dl. There was a higher percentage of patients with blood glucose levels between 144-200mg/dl, respectively 66.67%. For diabetic patients with blood glucose greatly increased (above 200mg/dl) the prevalence of periodontal disease was 100%, followed by a rate of 96.87% for patients with values between 144-200mg/dl. It is noticed that patients with uncontrolled diabetes have a higher prevalence of periodontal disease. Analyzing the glycosylated hemoglobin levels we found that the percentage of patients with HbA1 values lower than 7 or well-controlled diabetes were higher than that of patients with HbA1 values greater than 7 (66.66% versus 33.33, p<0,05). The prevalence of periodontal disease in patients with HbA1 values over 7 was 100%, compared with well-controlled patients where the prevalence of periodontal disease 86%. Chronic bacterial gingivitis 58.33% and mild forms of chronic superficial marginal periodontitis 41.67% were dominant in balanced diabetes patients, while patients with unbalanced diabetes manifested more severe periodontal disease, 25% presenting chronic superficial marginal periodontitis and 75% presenting chronic profound marginal periodontitis.

Table 1. Prevalence of periodontal disease forms according to the features of diabetes

<table>
<thead>
<tr>
<th>Forms of periodontal disease</th>
<th>Chronic bacterial gingivitis</th>
<th>profound marginal periodontitis</th>
<th>superficial marginal periodontitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycemic control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>unbalanced DM</td>
<td>0%</td>
<td>25%</td>
<td>75%</td>
</tr>
<tr>
<td>balanced DM</td>
<td>58.33%</td>
<td>41.67%</td>
<td>0%</td>
</tr>
<tr>
<td>Treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>diet hypoglucidic</td>
<td>66.66%</td>
<td>33.33%</td>
<td>0%</td>
</tr>
<tr>
<td>oral antidiabetics</td>
<td>16%</td>
<td>28%</td>
<td>56%</td>
</tr>
<tr>
<td>Insulin</td>
<td>0%</td>
<td>23.07%</td>
<td>76.92%</td>
</tr>
<tr>
<td>oral antidiabetics +Insulin</td>
<td>0%</td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>Number of complications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>33.33%</td>
<td>16.66%</td>
<td>33.33%</td>
</tr>
<tr>
<td>1</td>
<td>33.33%</td>
<td>16.66%</td>
<td>41.66%</td>
</tr>
<tr>
<td>2</td>
<td>0%</td>
<td>46.15%</td>
<td>53.84%</td>
</tr>
<tr>
<td>3</td>
<td>0%</td>
<td>25%</td>
<td>75%</td>
</tr>
<tr>
<td>&gt;3</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

The importance of maintaining glycemic control is also demonstrated by the prevalence of periodontal disease in patients with different types of therapy. Patients in whom hypoglucidic diet was enough to normalize glycemic values presented mild periodontal disease, gingivitis 66.66%) and chronic superficial marginal periodontitis. In patients treated with oral agents we observed the presence of all forms of periodontal disease, chronic profound marginal periodontitis being the dominant form (56%). Patients treated with insulin present a more important impairment of periodontal (chronic profound marginal periodontitis 76.92%), while patients treated with the combination of oral agents and insulin presented a rate of 60%. The important prevalence of profound forms to insulin-treated patients could be explained by a longer evolution of the disease and therefore a more difficult metabolic control.

Chronic diabetic complications were assessed in the study group. From the 48 studied patients, 42 had one, two or more general complications 17 presented
nephropathy, 20 had retinopathy, 28 presented ischemic heart disease, 2 had cerebrovascular disease, 3 presented arteriopathy, 20 had peripheral neuropathy and only 6 showed no complications. Since most patients had more complications, we investigated the prevalence of periodontal disease according to their number. We noticed that all patients who had two or more complications had periodontal disease at a rate of 100%, probably a consequence of unsatisfactory glycemic control and of a long evolution of diabetes. In addition, analyzing the periodontal disease forms it was found that the prevalence of chronic profound marginal periodontitis increase with the number of complications, in over 3 complications the prevalence being 100%, while chronic bacterial gingivitis is found in patients without complications or with only one complication, probably as a consequence of an unsatisfactory glycemic control and a long evolution of diabetes.

CONCLUSIONS

Overall, the data obtained in this study demonstrate the existence of epidemiological associations between diabetes and periodontal disease. Periodontal disease is more severe and progresses more rapidly than in non-diabetic patients so prevention and early diagnosis may be extremely important in order to prevent large and irreversible alveolar bone losses. The risk of periodontal disease is higher in long evolving diabetes and in those with poor controlled glycemic values. Also periodontal disease is more frequent and more serious in patients presenting more chronic complications. In conclusion, periodontal disease must be included as a complication of diabetes mellitus along micro- and macrovascular complications and even considered as an important metabolic control indicator due to its early clinical manifestation.

REFERENCES