Assessment Of Periodontal Health In Young Patients With Type 1 Diabetes Mellitus

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Abstract

Background: Diabetes mellitus is a chronic metabolic disorder caused by an altered metabolism of carbohydrates, proteins and fats, characterised by high levels of glucose in the bloodstream. The present study was conducted to assess periodontal health in young patients with type 1 diabetes mellitus.

Materials & Methods: 58 patients of type I diabetes (Group I) of both genders and equal number of healthy controls (group II) were enrolled. Periodontal status was determined based on gingival index (GI) according to Löe and Silness (GI), plaque index, probing index and clinical attachment level was recorded.

Results: Out of 58 patients, males were 32 and females were 26. Plaque index was 2.3 and 0.9, gingival index was 1.8 and 0.7, probing depth was 3.8 mm and 1.2 mm and clinical attachment level was 1.2 mm and 0.8 mm in group I and group II respectively. The difference was significant (P< 0.05).

Conclusion: Young type I diabetes mellitus patients were at risk of periodontal diseases.

Key words: Diabetes mellitus, periodontal disease, fats

INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder caused by an altered metabolism of carbohydrates, proteins and fats, characterised by high levels of glucose in the bloodstream.¹ The incidence of diabetes is high in industrialised countries and tends to increase over the years.² According to the IDF data, more than 387 million people are suffering diabetes and in 2035 the number will increase probably to 592 million people.³ Etiology of this ailment is not fully known. It is assumed that diabetes is most frequently caused by viral infection in genetically predisposed subjects and by autoimmunization directed against cells of the pancreas that leads to their destruction.⁴ Viruses showing affinity to the pancreas are, e.g. viruses of hepatitis B, influenza, parainfluenza, cytomegaly and rubella. Other pathogens include many chemical substances as well as the mode of nutrition.⁵ The existence of a correlation between periodontal disease and diabetes mellitus is described in the literature; in particular, diabetes seems to be more a predisposing factor rather than a direct causal factor in periodontal disease.⁶ The risk of periodontitis in diabetic patients is increased in subjects with high levels of bacterial plaque and poor oral hygiene, and the presence of gingival inflammation over time may facilitate the onset of periodontal disease.⁷,⁸ The present study was conducted to assess periodontal health in young patients with type 1 diabetes mellitus.

MATERIALS & METHODS

The present study comprised of 58 patients of type I diabetes (Group I) of both genders. All gave their written consent for the participation in the study. For comparison equal number of healthy controls (group II) were also enrolled. Data such as name, age, gender etc. was recorded. Periodontal status was determined based on gingival index (GI) according to Löe and Silness (GI), plaque index, probing index and clinical attachment level was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

<table>
<thead>
<tr>
<th>Table 1: Distribution of patients</th>
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<tbody>
<tr>
<td><strong>Total- 58</strong></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td>Number</td>
</tr>
</tbody>
</table>
Table I shows that out of 58 patients, males were 32 and females were 26.

**Table II: Comparison of periodontal status**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group I</th>
<th>Group II</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plaque index</td>
<td>2.3</td>
<td>0.9</td>
<td>0.03</td>
</tr>
<tr>
<td>Gingival index</td>
<td>1.8</td>
<td>0.7</td>
<td>0.05</td>
</tr>
<tr>
<td>Probing depth (mm)</td>
<td>3.8</td>
<td>1.2</td>
<td>0.01</td>
</tr>
<tr>
<td>Clinical attachment level (mm)</td>
<td>1.6</td>
<td>0.8</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Table II, graph I shows that plaque index was 2.3 and 0.9, gingival index was 1.8 and 0.7, probing depth was 3.8 mm and 1.2 mm and clinical attachment level was 1.2 mm and 0.8 mm in group I and group II respectively. The difference was significant (P< 0.05).

**Graph I: Comparison of periodontal status**

DISCUSSION

There are two forms of diabetes: type 1 caused by the total or partial destruction of the pancreatic cells that produce insulin in response to an autoimmune reaction, while type 2 is linked to a mechanism of insulin resistance. The onset of type 1 diabetes usually occurs in childhood or adolescence and it is less common than type 2, as it includes only 5-10% of all forms. In order to avoid or reduce the symptoms and complications of diabetes, such as retinopathy, nephropathy and neuropathies, it is important for the patient to maintain a good control of blood sugar, which is assessed by the measurement of glycated haemoglobin (HbA1c). The present study was conducted to assess periodontal health in young patients with type 1 diabetes mellitus.

We found that out of 58 patients, males were 32 and females were 26. Giuca et al evaluated the effects of type 1 diabetes and the possible role of metabolic control on the periodontal status of diabetic adolescents. Three groups of 40 patients each were examined: diabetic subjects with a good metabolic control (well controlled WC) (glycated haemoglobin HbA1c ≤ 7%) (20 males and 20 females; mean age: 14.1±1.5 years); diabetic subjects with poor metabolic control (poorly controlled PC) (glycated haemoglobin HbA1c > 7%) (20 males and 20 females; mean age: 14.5 ± 1.3 years); and patients in good general health, which constituted the control group (20 males and 20 females; mean age: 14.1±1.2 years). For each subject, a periodontal evaluation was performed and the following parameters were assessed: Plaque Index (PI), Gingival Index (GI), Bleeding on probing (BOP), Probing Depth (PD), Clinical Attachment Level (CAL). The levels of PI in WC subjects (1.9 ± 0.8) and in PC subjects (2.1 ± 0.6) were significantly higher compared to healthy subjects in the control group (0.8 ± 0.7). PC (60.2 ± 23.6%) and the WC (57.4 ± 22.5%) groups was significantly higher compared to healthy subjects (35.9 ± 18.7%) (p< 0.05). In addition, the comparisons between groups PC and WC were not statistically significant.

We found that plaque index was 2.3 and 0.9, gingival index was 1.8 and 0.7, probing depth was 3.8 mm and 1.2 mm and clinical attachment level was 1.2 mm and 0.8 mm in group I and group II respectively. Al Khabbaz et al evaluated periodontal health in children diagnosed with type 1 diabetes mellitus. Periodontal health was clinically examined and compared in 95 children diagnosed with type 1 diabetes and 61 healthy control subjects. Plaque index, gingival index, clinical attachment loss and bleeding on probing were assessed on the 6 Ramfjord index teeth. Diabetes history was
recorded based on information provided by the physician from the medical record of each diabetic child. Diabetes history included date of diagnosis, diabetes duration, age at diagnosis, latest reading for glycosylated hemoglobin and any existing diabetes complications. Sixty-two of the diabetic children (65%) had poor compliance with dental care, and 42 of them (44%) had never visited the dentist before. The children with type 1 diabetes mellitus had a significantly higher plaque index and gingival index and more bleeding on probing than control subjects. In the diabetic group, periodontitis was significantly associated with longer duration of diabetes and older age at diagnosis of diabetes. Luczaj-Cepowicz et al.16 examined 50 young people with IDDM (25 girls and 25 boys) and 50 healthy subjects (25 girls and 25 boys). Mean age of examined persons was about 14 years. They investigated gingival indexes: GI (Gingival Index) and PBI (Papillary Bleeding Index) and periodontal indexes: PI (Periodontal Index) and PDI (Periodontal Disease Index). The results were statistically analysed, and significant differences we observed for p<0.05. The mean scores of Gingival Index and Papillary Bleeding Index were lower in healthy subjects but differences were not statistically significant. Only maximum scores of these indexes were significantly higher in diabetics. The mean and maximum values of Periodontal Index were significantly higher in patients with IDDM. They did not notice differences between mean scores of PDI in both examined groups. Analysis of maximum values of Periodontal Disease Index reveals higher level in diabetic girls than in female controls. The limitation the study is small sample size.

CONCLUSION
Authors found that young type I diabetes mellitus patients were at risk of periodontal diseases.

REFERENCES