Factors associated with parotid gland enlargement among poorly controlled Type II Diabetes Mellitus

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ABSTRACT

Background: Microscopic examination of parotid gland reveals hypertrophy of the acinar cells sometimes two to three times greater than normal size of PG, in cases associated with longstanding diabetes. This study was designed to determine the effects of duration, fasting plasma glucose and glycosylated hemoglobin on parotid gland enlargement among poorly controlled type 2 diabetes mellitus.

Subjects, Materials, and Method: This study was conducted on 36 parotid glands of 18 with type 2 DM, at age range (40-60) years, all of them were selected from subjects attending (Endocrine clinic for diabetic patients) in Baghdad Teaching Hospital. PG was measured with ultrasonography in both longitudinal and horizontal plane.

Results: The rate of enlargement of PG was higher with higher duration period of DM study sample, also the rate of enlargement of PG was higher with higher value of HbA1c % and finally the rate of enlargement of PG was higher with higher fasting serum glucose level among DM study group.

Conclusion: This result show that the duration is the most effective factor associated with parotid gland enlargement among poorly controlled type 2 DM.

Key words: Diabetes mellitus, duration, fasting plasma glucose, glycosylated hemoglobin.

INTRODUCTION

Duration of disease, and degree of metabolic controls play an important role in oral complications and salivary gland involvement of diabetes rather than whether the types of disease was type 1 DM or type 2 DM (1),(2). In cases associated with long duration DM there may be acinar atrophy and fatty infiltration associated with sialadenosis (3),(4).

The onset and progression of the complication in DM was strongly linked to the presence of sustained hyperglycemia, while the complication rate and the severity of the complications increased as the duration of the disease increases (5),(6). The enlargement of PG and xerostomia can occur with DM and both of them may be related to the metabolic control which come in conformity with our result (7).

SUBJECTS, MATERIALS, AND METHOD

This study was conducted on 36 parotid glands of 18 females with type 2 DM, at age range (40-60) years, all of them were selected from subjects attending (Endocrine clinic for diabetic patients) in Baghdad Teaching Hospital. The body weight, subject must not exceeded 20% from the Ideal Body Weight (IBW), according Broca’s formula IBW=height-100 (8). Ultrasonography with 7.5 MHz probe was used to measure the parotid gland in longitudinal plane to measure the length of gland and horizontal plane to measure anteroposterior dimension of the gland.

Figure 1: Longitudinal plane of probe.
Figure 2: Transverse plane of probe

Assessment of type 2 DM poorly controlled patients:
1- Fasting plasma glucose (FPG) test: This test was done in (Baghdad Teaching Hospital laboratory) for study group and also done for control group to ensure that all subjects in control group were free from this disease. According to American Diabetic Association, FPG reveals that glucose level for healthy subjects was between 60-110mg/dl, while for patients with DM was 126 mg/dl and over.
2- Glycosylated hemoglobin A1c test (HbA1c): This test was done in (Teaching Laboratories) for study group to assess the controlling of patients for this disease. This test showed that for optimal diabetic control HbA1c value not great than 7% and until 7.9% consider a moderate or acceptable control, while from 8% - 9.5% represent poor control DM patients

RESULT
The rate of enlarged parotid gland increase with increasing of associated factors significantly.

A higher duration of disease was significantly associated with a high rate of parotid enlargement. The rate increase from 0% for those with lowest duration to 90% for those with higher duration.
A higher HbA1c% was significantly associated with a high rate of parotid enlargement. The rate increase from 30.8% for those with lowest duration to 80% for those with higher HbA1c%.
A higher serum fasting glucose was significantly associated with a high rate of parotid enlargement. The rate increase from 16.7% for those with lowest duration to 81.8% for those with higher fasting serum glucose.
A higher age group was significantly associated with a high rate of parotid enlargement. The rate increase from 20% for those with lowest duration to 65% for those with higher old age.

DISCUSSION
Our result were very close to those obtained by Coleman in 1998, similar finding of Richard et al and Carda, who stated that, duration of disease and degree of metabolic controls play an important role in oral complications and salivary gland involvement of diabetes rather than whether types of disease was type 1 or type 2 DM.
Mealey stated that, the onset and progression of the complication in DM was strongly linked to the presence of sustained hyperglycemia, while the complication rate and the severity of the complications increased as the duration of the disease increases.
Sreebny et al found that, the enlargement of parotid gland and xerostomia can occur with DM and both of them may be related to the metabolic control which come in conformity with our result.

Table 1: The rate of enlarged parotid gland by selected independent variables among DM cases.

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Enlarged Parotid gland</th>
<th>P (Chi-square)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Duration of DM (years)-tertiles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowest (first) tertile (&lt;= 7.0)</td>
<td>14</td>
<td>0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Middle (second) tertile (7.1 - 14.0)</td>
<td>12</td>
<td>6</td>
<td>50</td>
</tr>
<tr>
<td>Highest (third) tertile (14.1+)</td>
<td>10</td>
<td>10</td>
<td>90.9</td>
</tr>
<tr>
<td>2. HbA1c % -tertiles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowest (first) tertile (&lt;= 8.2)</td>
<td>14</td>
<td>4</td>
<td>30.8</td>
</tr>
<tr>
<td>Middle (second) tertile (8.3 - 8.8)</td>
<td>12</td>
<td>4</td>
<td>33.3</td>
</tr>
<tr>
<td>Highest (third) tertile (8.9+)</td>
<td>10</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td>3. Fasting serum glucose (mg/dl)-tertiles</td>
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</tr>
<tr>
<td>Lowest (first) tertile (&lt;= 250)</td>
<td>14</td>
<td>4</td>
<td>16.7</td>
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<tr>
<td>Middle (second) tertile (251 - 370)</td>
<td>12</td>
<td>4</td>
<td>41.7</td>
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<tr>
<td>Highest (third) tertile (371+)</td>
<td>10</td>
<td>8</td>
<td>81.8</td>
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<td>4. Age group (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>16</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>50-60</td>
<td>20</td>
<td>12</td>
<td>65</td>
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</table>
Figure 3: Bar chart showing the rate of enlarged parotid gland by selected independent variable among DM cases.

REFERENCES


