INTRODUCTION

Nitric oxide (NO) is an important messenger molecule, which is involved in various physiological processes, such as the regulation of vascular tone, inhibition of platelet aggregation, neurotransmission and immune response (Moncada et al., 1991). Several studies suggested the involvement of NO in the progression of periodontal disease (Matejka et al., 1998; Rausch-Fan & Matejka, 2001; Batista et al., 2001). Measurements of nitrite concentrations in biological fluids could be important indicators of the NO production in the organism (Vallance & Collier, 1994). However, such measurements were rarely performed in periodontitis patients. Some studies found an increased salivary nitrite levels in periodontitis patients, whereas other studies came to opposite conclusion (Aurer et al., 2001; Reher et al., 2007; Ozer et al., 2011). Therefore, in the present study we investigated the levels of NO metabolites NO2 in saliva of periodontitis patients.

MATERIAL AND METHODS

A total of 122 subjects (82 patients with advanced periodontitis and 40 periodontally healthy individuals) were included in the present study. Whole saliva was collected after an overnight fast using the saliva collection system® (Greiner Bio-One, Austria). Saliva collection was performed between 8.00 and 11.00 am to avoid circadian rhythm effects. Sampling in the periodontitis group was made prior to a planned conservative periodontal therapy. The percentage of whole saliva per sample was measured using a collection system® (Greiner Bio-One, Austria). Levels of NO2 in the saliva samples were determined using nitrite/nitrate colorimetric assay kit (Sigma, St.-Louis, USA).

Since the levels of NO metabolites depend substantially on individual’s gender (Watanabe et al., 2000; Ghasebi et al., 2007) these parameters were analyzed in different gender groups.

Data are presented as mean ± SEM. The differences between groups were tested by Mann-Whitney U-test.

RESULTS

Mean age, smoking status, and the results of periodontal examination of periodontitis patients and healthy controls are given in Table 1. Periodontitis patients were significantly older than healthy individuals (p < 0.01). API, PBI, BoP and the number of teeth with PD higher than 5 mm were significantly higher in diseased group. The mean percentage (± SD) of saliva per sample was 72.1 % ± 7.1 and did not differ between patients and controls.

Salivary levels of NO2 in different gender and diagnosis groups are shown in Figure 1. Healthy men exhibited significantly higher salivary NO2 levels compared to healthy women. Within male individuals, salivary NO2 levels were significantly lower in periodontitis patients than in healthy controls. In contrast, in female no significant difference in salivary NO2 levels was observed between healthy and periodontitis groups.

Figure 2 shows the relationship between salivary NO2 levels and the number of teeth with PD higher than 5 mm in male periodontitis patients. A significant negative correlation was observed between these parameters (r=-0.45, p=0.001). No correlation of salivary NO2 with other clinical parameters was found in both male and female groups.

CONCLUSION

Summarizing, our data suggest that NO production is impaired in periodontitis patients, mainly within male population. Particularly, within male patients, periodontitis is associated with lower salivary NO2 levels. The decreased NO production in men with periodontitis could be associated with local inflammation.

Table 1. Demographic and clinical characteristics of study’s groups.

<table>
<thead>
<tr>
<th></th>
<th>male</th>
<th>female</th>
</tr>
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<tbody>
<tr>
<td>Age (yr)</td>
<td>33.4±1.4</td>
<td>33.1±1.6</td>
</tr>
<tr>
<td>Smoking, %</td>
<td>35.2</td>
<td>35.8</td>
</tr>
<tr>
<td>API</td>
<td>21.3±2.1</td>
<td>21.4±2.9</td>
</tr>
<tr>
<td>PBI</td>
<td>9.6±2.7</td>
<td>10.0±2.7</td>
</tr>
<tr>
<td>BoP</td>
<td>5.9±1.5</td>
<td>5.6±2.3</td>
</tr>
<tr>
<td>PD&gt;5</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 1. Demographic and clinical characteristics of study’s groups. Data are presented as mean ± SEM. API, plaque index; PBI, bleeding on probing; PD, pocket depth, measured on deepest site.

REFERENCES