Self-perception of generalized aggressive periodontitis symptoms and its influence on the compliance with the oral hygiene instructions - a pilot study

Renato Corrêa Viana Casarin, Erica Del Peloso Ribeiro, Francisco Humberto Nociti Jr, Enilson Antônio Sallum, Antonio Wilson Sallum, Márcio Zaffalon Casati

1DDS, MS, PhD, Assistant Professor, University São Francisco, Brazil  
2DDS, MS, PhD, Assistant Professor, Bahia Foundation of Science, Brazil  
3DDS, MS, PhD, Professor, Piracicaba Dental School, State University of Campinas, Brazil

Abstract

Aim: Patient's adherence to the periodontal treatment is fundamental to the success of the therapy. Lack of response to the clinician's instructions is influenced by various factors, including gender, age and psychosocial profile. The aim of the present study was to evaluate the relationship between self-perceived symptoms of generalized aggressive periodontitis and compliance with the oral hygiene instructions. Methods: Twenty-six subjects presenting a generalized aggressive form of periodontal disease were selected. The subjects answered a questionnaire to rate the perceived symptoms of periodontal disease with a sensitivity scale, in which a numeric score is attributed to each mentioned symptom. The percentage of sites with pocket probing depth (PPD) ≥ 5mm as well as the plaque index (PI) and gingival index (GI) were evaluated and the patients received a full mouth prophylaxis. One month later, the patients were re-evaluated for PI, GI, and PPD, and their percent reductions were correlated with the numeric score attributed to the aggressive periodontitis symptoms. Spearman's correlation and Wilcoxon's test were used with a significance level of 5%. Results: The greater the self-perception of some of the symptoms, the greater the adherence to the oral hygiene instructions. A positive correlation was observed between the reduction of GI and self perception of bleeding on tooth brushing (p=0.04, r=0.27) and redness and swelling of gums (p=0.04, r=0.26). Conclusions: The self-perception of symptoms of generalized aggressive periodontitis could have an influence on the patient's response to the oral hygiene instructions.

Keywords: compliance, generalized aggressive periodontitis, periodontal disease symptoms, self perception, oral hygiene instructions.

Introduction

A major aspect of the effective treatment of periodontal disease is adequate oral hygiene, which consists of a combination of daily tooth brushing, interdental cleaning, and when necessary, use of chemotherapeutic agents (e.g. mouthwash). Therefore, the success of the treatment ultimately relies on patients'...
compliance with daily dental care, in which satisfactory plaque and inflammation control is fundamental.

Unfortunately, evidence shows that only a portion of the patients actually comply with the treatment and the level of adherence decreases as the time of treatment is extended over the years. Ciancio suggested that this lack of compliance would lead to serious consequences for chronic periodontitis, and there is an urgent need to develop and validate effective strategies to improve the performance of patients with periodontitis in applying daily prophylactic dental care and identifying the reasons for their non-compliance.

Patient adherence depends on believing in the necessity of following preventive and/or treatment recommendations and this has been addressed in numerous studies that have investigated patients’ behavioral practices with regard to adherence to the treatment of periodontal disease, especially oral hygiene. Some reasons given for non response with respect to oral hygiene include unwillingness to perform oral self-care, lack of motivation and poor dental health beliefs.

An important consideration is that adherence also depends on social and psychological factors. Background factors that influence periodontal disease and beliefs regarding oral health could have a negative influence on the adhesion to Supportive Periodontal Treatment. Age and gender can also negatively modify adherence to the treatment.

Some theories of human cognitive behavior have also been used to explain non-compliance. The four main theories include the health belief model (HBM); transtheoretical model (TM); theory of reasoned action/theory of planned behavior (TRA); and the social-cognitive theory (SC).

The HBM focuses on an individual’s perception of the threat posed by a health problem. The TM is concerned with an individual’s readiness to change. The TRA focuses on an individual’s intention to perform a behavior. The SC incorporates intra-personal and inter-personal factors and suggests that the benefits of behavior must outweigh the costs.

In this context, self perception of the symptoms could have an influence on adherence to periodontal treatment, since the determining factor is that the patient must seek treatment, and this could represent the real importance the patient attaches to oral conditions.

This idea increases in importance when considering severe periodontal disease, such as aggressive periodontitis, recognized as a rare condition affecting young subjects, and presents rapid periodontal destruction, also induced and aggravated by biofilm accumulation. Thus, the recognized approaches known to contribute to patient adhesion to oral hygiene could be useful tools in therapy to control the disease.

The aim of the present study was to evaluate the relationship between self-perception of generalized aggressive periodontitis symptoms and adherence to the oral hygiene instructions.

Material and methods

Subjects

The patients enrolled in the present study were selected from those initially referred to the Periodontal Clinic of the Piracicaba Dental School, State University of Campinas, Brazil for oral examination and periodontal treatment. Patients who presented generalized aggressive periodontitis were selected in accordance with the following inclusion criteria: 1) under 35 years of age; 2) clinical and radiograph attachment loss on incisors and first molars, and in three other teeth; 3) at least 8 sites with pocket probing depth (PPD) > 5 mm, of which 3 of them with PPD > 6 mm; and 4) at least 20 teeth in the mouth. The exclusion criteria were: 1) smoking and pregnancy/nursing mothers; 2) use of mouthrinse or antibiotics 6 months before the study; 3) history of relevant medical condition; and 4) periodontal treatment, including professional prophylaxis, 6 months before the study.

Ethics

The study protocol was previously approved by the Institutional Clinical Research Ethics Committee of the State University of Campinas (UNICAMP) Protocol No. 24/2006. All the selected patients received and signed an informed consent form and thereby agreed to participate in the study.

Questionnaire

Initially, the patients received a questionnaire to assess their periodontal status. The patients were questioned about their perception of: pain in the gums, bleeding while brushing, bad breath, spaces between the teeth, mobility of teeth, redness and swelling of gums, dry mouth, bad taste, recent loss of teeth, loss of interproximal gingival tissue and sensitivity when drinking cold or hot drinks. Each affirmative was scored from NO FEELING to STRONG FEELING.

Clinical parameters and compliance assessment

The measurements were made by a single calibrated examiner (kappa index = 0.91) using a periodontal probe (PCPUNC 15-Hu-Friedy/Chicago, IL, USA), at the beginning of the study.

A dichotomous analysis of the presence of plaque (Plaque Index - PI) was made on six surfaces of each tooth, excluding the third molars. The presence of dental plaque accumulation on the buccal, lingual and proximal surfaces of all teeth was assessed using a periodontal probe. To determine the gingivitis status of each patient, a dichotomous
The gingival margin within 10 s after probe stimulation was considered positive. PI and GI were evaluated at the beginning and thirty days after the patient received prophylaxis and oral hygiene instructions. Reduction in PI and GI was considered to assess each patient’s level of compliance with the oral hygiene instructions.

Correlation between self-perception and severity of the disease was also studied. Initially, the total number of sites with probing depth ≥ 5 mm presenting bleeding on probing was determined in a baseline examination using a periodontal probe. After that, a percentage of these sites per patient was calculated (PPD).

### Prophylaxis and Oral Hygiene Instructions

Immediately after the first evaluation, professional prophylaxis was performed in each patient, consisting of calculus and plaque removal with an ultrasonic device (Profi III – Bios, Dabi-Atlante, Ribeirão Preto, SP, Brazil) and brushes. After this, patients were given instructions on toothbrushing and interproximal cleaning with dental floss. All the patients received the same protocol of prophylaxis and instructions. The importance of plaque control and instructions on oral care were reinforced within 15 days after the first session.

### Data Analysis

The Biostat® program (Version 3.0) was used to determine the relationship between the parameters. Spearman’s correlation test was used to test the relationship between the values of self-perception and initial PI and GI values, as well as the PPD values. To determine the influence of self-perception of symptoms on adherence to the oral hygiene instructions, the percent reduction in PI and GI was also correlated with these values. Wilcoxon’s test was used to evaluate the difference in PI and GI before and after initial treatment. The level of significance was set at 5%.

### Results

Twenty-six patients were enrolled in this study. The mean age was 27.1 ± 4.9 years. Gender distribution revealed a predominance of females (73.1%).

The PI and GI values and the results of treatment are shown in Table 1. The initial PI was 56.8% and 30 days after the prophylaxis and oral hygiene instructions this value declined to 28.4% (p<0.0001). There was also a statistically significant reduction in GI after the treatment (28.4% to 16.9%) (p<0.0001).

The self-perception values attributed by each patient are shown in Table 2. None of the perception values showed a correlation with the initial PI and GI values (Table 2), and no correlation was observed between the self-perceived symptoms and the reduction in PI.

There was however, a positive correlation between the perception of some of the symptoms and reduction in GI. The greater the perception of bleeding on tooth brushing (p = 0.04, r = 0.27) and redness and swelling of gums (p = 0.04, r = 0.26), the greater the reduction in bleeding (statistical significance shown by Spearman’s correlation) (Table 2).

The mean percentage of sites with probing depth ≥ 5mm with bleeding on probing was 63 ± 20%. The Spearman’s correlation test also showed no correlation between this percentage and the self-perceived symptom scores (Table 2).

### Discussion

The efficient inflammation control obtained by means of supragingival plaque control is fundamental to periodontal treatment success, and many psychosocial and psychological characteristics influence the patient’s adherence to the oral hygiene instructions. The proper perception of oral health could influence adherence by showing the real importance the patient attaches to the treatment, determining a high or low acceptance of the oral hygiene instructions. This is particularly important in young patients, who normally present a low adherence to treatment. Thus, the present study was designed to evaluate the relationship between the self-perception of generalized aggressive periodontitis symptoms and patient compliance with instructions.

The results showed that the patients with a greater perception of some of the aggressive periodontitis symptoms adhered to the treatment more firmly, with greater reductions in the GI within 1 month. A positive correlation was found between the perception of bleeding on tooth brushing and redness and swelling of the gums and reductions in the GI. Moreover, these symptoms, which recent studies have shown to be normally associated with periodontal disease, were those most perceived by the patients.

This correlation could be involved in a personal definition of disease by patients. Patient’s definition of disease differs from that of the professionals’ definition. Professionals usually consider the presence or absence of illness whereas patients consider the social and functional problems caused by the disease, such as the capacity to smile, speak and chew. Hence, the social influence of the disease appears to interfere more significantly in the perception than the presence of the actual disease, and to the patients, bleeding and swelling of gums could represent a social impact.

This difference regarding the influence based on the definition of the disease was ratified by another result found in the present study. None of the self-perceived symptoms of the disease showed a correlation with the percentage of sites presenting bleeding, and with PPD ≥5mm. Patients appear to perceive the disease differently from the actual disease.
Table 2. Patients referred perception of aggressive periodontitis symptoms (mm) and its correlation with initial and reduction values of PI and GI and Proportion of sites with probing depth (PPD) $\geq 5$ mm.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Self perception (mm±SD)</th>
<th>PI initial</th>
<th>PI reduction</th>
<th>GI initial</th>
<th>GI reduction</th>
<th>PPD ≥ 5mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain when biting</td>
<td>12.88±13.10</td>
<td>0.21 (0.19)</td>
<td>0.20 (0.16)</td>
<td>0.41(-0.27)</td>
<td>0.86(-0.08)</td>
<td>0.35(-0.21)</td>
</tr>
<tr>
<td>Bleeding on brushing</td>
<td>38.39±21.32</td>
<td>0.27 (0.19)</td>
<td>0.33 (0.03)</td>
<td>0.77 (0.04)</td>
<td>0.04* (0.26)</td>
<td>0.06 (-0.38)</td>
</tr>
<tr>
<td>Bad breath</td>
<td>25.26±19.07</td>
<td>0.90 (0.00)</td>
<td>0.25(-0.26)</td>
<td>0.35(-0.09)</td>
<td>0.51(-0.17)</td>
<td>0.19 (-0.29)</td>
</tr>
<tr>
<td>Space between teeth</td>
<td>27.22±25.70</td>
<td>0.77 (0.11)</td>
<td>0.95 (0.10)</td>
<td>0.74 (0.01)</td>
<td>0.35(-0.03)</td>
<td>0.68 (0.06)</td>
</tr>
<tr>
<td>Mobility of teeth</td>
<td>28.39±24.26</td>
<td>0.79 (0.06)</td>
<td>0.68 (0.05)</td>
<td>0.23(-0.25)</td>
<td>0.86(-0.12)</td>
<td>0.58(-0.09)</td>
</tr>
<tr>
<td>Redness and swelling of gums</td>
<td>38.41±19.41</td>
<td>0.82 (0.01)</td>
<td>0.49(-0.23)</td>
<td>0.28(-0.18)</td>
<td>0.04* (0.27)</td>
<td>0.80(0.08)</td>
</tr>
<tr>
<td>Dry mouth</td>
<td>20.46±22.84</td>
<td>0.63 (0.11)</td>
<td>0.90(-0.13)</td>
<td>0.67 (0.00)</td>
<td>0.13(-0.12)</td>
<td>0.31(-0.07)</td>
</tr>
<tr>
<td>Bad taste</td>
<td>26.05±20.69</td>
<td>0.51 (0.06)</td>
<td>0.85(-0.22)</td>
<td>0.87 (0.01)</td>
<td>0.69(-0.26)</td>
<td>0.82(-0.02)</td>
</tr>
<tr>
<td>Recent loss of tootha*</td>
<td>0.00±0.46</td>
<td>0.60 (0.07)</td>
<td>0.86 (0.03)</td>
<td>0.61 (0.12)</td>
<td>0.17(-0.21)</td>
<td>0.24(0.25)</td>
</tr>
<tr>
<td>Loss of interproximal gingival tissue</td>
<td>17.24±22.74</td>
<td>0.81 (0.07)</td>
<td>0.96 (0.01)</td>
<td>0.53 (0.11)</td>
<td>0.42(-0.11)</td>
<td>0.80(0.01)</td>
</tr>
<tr>
<td>Sensitivity when drink cold drinks</td>
<td>32.19±20.13</td>
<td>0.59 (0.08)</td>
<td>0.50(0.05)</td>
<td>0.20(0.13)</td>
<td>0.25(-0.15)</td>
<td>0.90(0.03)</td>
</tr>
</tbody>
</table>

* $p$ (r value).
* $a$ referred to modal value.
* $c$ Statistical significance correlation (p≤0.05) at Spearman test.
patient-specific approach to improve their knowledge and self-perception of symptoms and ultimately their compliance with the treatment.

In conclusion, within the limitations of this study, patient adherence to oral hygiene instructions could be related to the self-perception of generalized aggressive periodontitis symptoms.

References