Compliance with supportive periodontal therapy among patients with aggressive and chronic periodontitis

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Abstract: Compliance with supportive periodontal therapy (SPT) depends on many factors but is generally poor. We compared SPT compliance among patients with aggressive and chronic periodontitis. This single-center longitudinal observational study enrolled 101 patients with generalized aggressive periodontitis (GAP; n = 52) or generalized chronic periodontitis (GCP; n = 49) to compare SPT compliance. All participants were studied for 1 year before the close of data collection. Compliance was classified as complete (100% of programmed visits), erratic (≥50% of programmed visits), or noncompliant (<50% of programmed visits). The proportion of compliant participants was greater among patients with GAP (57.7%) than among those with GCP (30.6%) (P < 0.003); 44.9% of patients with GCP and 15.4% of those with GAP were noncompliant. Compliance was significantly associated with age and sex among patients with GAP. In conclusion, SPT compliance was better in patients with GAP than in those with GCP. Patient attitude and self-belief appear to be important factors in SPT compliance.


Keywords: periodontal diseases; patient compliance; patient adherence.

Introduction
Periodontitis is a progressive infectious disease of periodontal tissue and can lead to tooth loss and impaired functioning of dentition. Progression of periodontal destruction can be prevented or limited by a number of treatment modalities. The American Academy of Periodontology (1) guidelines for periodontal therapy state that, upon completion of active periodontal treatment, an appropriate program of supportive periodontal treatment, specific to individual circumstances, should be recommended to patients.

A number of terms have been used to refer to supportive periodontal therapy (SPT), including recall and maintenance, but the term SPT was officially adopted at the 1989 World Workshop in Clinical Periodontology (2). SPT includes an update of medical and dental histories, radiographic review, extraoral and intraoral soft tissue examination, dental examination, periodontal evaluation, removal of supragingival and subgingival bacterial plaque, scaling and root planing (where necessary), polishing of teeth, and a review of the patient’s plaque control measures and other appropriate behavior modification (1).

In dentistry, compliance is defined as patient cooperation in performing suggested home care and returning for maintenance visits to arrest disease progression and maintain the health and function of dentition (3). Patients who comply with suggested maintenance intervals are able to maintain periodontal health, as indicated by reduced probing depth, less bleeding on probing, and a lower plaque index (4). Wilson et al. (5) classified SPT compliance as complete compliance, erratic compliance,
and noncompliance. Published evidence indicates that patient compliance with maintenance therapy is generally poor (5,6). Economic and psychological factors may at least partially explain differences in compliance (7-9). Other factors are lack of satisfaction (10), fear of dental treatment, cost, socioeconomic status (SES) (7,11,12), age, sex, type of periodontal therapy, and cultural and geographic characteristics (13,14). However, no study has considered the effect of periodontal disease type (e.g., aggressive vs. chronic periodontitis) on compliance with periodontal maintenance.

The overall treatment concepts and goals do not markedly differ for aggressive and chronic periodontitis. However, the considerable amount of bone loss relative to the young age of patients with pathological tooth migration and early mobility of teeth affects the psychological condition of patients. Thus, a comprehensive treatment plan, including SPT, is warranted for patients with aggressive periodontitis. Attitudes and behavior regarding SPT compliance may change in patients with rapid disease progression leading to early disfigurement of dentition. Hence, this study was undertaken to compare compliance with the suggested maintenance schedule among patients with generalized aggressive (GAP) and generalized chronic periodontitis (GCP). We hypothesized that there would be no difference in compliance between these two patient groups.

**Materials and Methods**

The present longitudinal study included 125 patients who sought treatment at the outpatient clinic in our Department of Periodontology during 2011-2014. The patients were 67 (53.6%) men and 58 (46.4%) women (mean age, 33.7 years; age range, 20-40 years). Before starting the study, ethical approval was obtained from the institutional ethical board of the People’s Dental Academy (PDA/IEC/2011/900/perio/18). Written informed consent was obtained from all enrolled patients.

All enrolled patients were classified on the basis of the criteria established by the 1999 World Workshop on Periodontal therapy, if required. Throughout therapy, patients were informed of the importance of maintenance care for long-term disease prevention. All patients were scheduled to receive maintenance therapy every 3 months, which was later modified for some patients, according to their needs. All enrolled patients were eligible for a maintenance program of at least 1 year before the close of data collection.

Patient compliance with the recommended recall schedule was classified as compliant, erratic, or noncompliant. Patients who regularly reported at all scheduled times (100%) were classified as compliant. Patients who did not follow the recommended schedule but reported for at least 50% of the programmed visits were classified as erratic. The remaining patients, who reported for fewer than 50% of the programmed visits, were classified as noncompliant.

The effects of age, sex, and SES (16) on compliance were also analyzed. In addition, patients’ reasons for erratic compliance or noncompliance were assessed by face-to-face or telephone interviews.

The Statistical Package for Social Sciences (SPSS Version 19; Chicago, IL, USA) was used for all data analysis. The significance of differences between groups were evaluated by using the chi-square test and t-test. Stepwise multiple linear regression analysis was used to estimate the linear relationship between dependent variables and independent variables. The significance level was fixed at $P < 0.05$.

**Results**

Among the 125 patients enrolled, 101 completed the study. The other 24 patients either did not complete the active phase of periodontal therapy or moved outside the study area before completion of the study. Out of these 101 participants, 52 (22 men and 30 women) had GAP and 49 (24 men and 25 women) had GCP. The average number of maintenance visits was 5.54 for the GAP patients and 4.73 for the GCP patients.

The proportion of compliant patients was higher among patients with GAP (57.7%) than among those with GCP (30.6%); patients with GCP had greater noncompliance (44.9%) than did patients with GAP (15.4%) (Table 1).

Mean age significantly differed between groups (28 years in GAP vs. 38.2 years in GCP; $P < 0.001$) (Table 2). Mean age significantly differed between noncompliant patients with GAP (31.5 years) and those with GCP (37.8 years) ($P < 0.001$). There was no significant difference between groups in sex ratio or SES (Tables 3, 4). Stepwise multiple linear regression analysis showed that age and sex were significantly associated with compliance.

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Compliance was more strongly associated with age (12.1%) than with sex (8.1%) (Table 5). However, no such associations were seen in patients with GCP. Patients gave many reasons for being erratic or noncompliant with SPT, e.g., insufficient time, long traveling distances, financial problems, fear of treatment, and dissatisfaction with treatment. However, none of these factors was significantly associated with compliance (Table 6).

### Discussion

SPT compliance was better in patients with GAP than among patients with GCP. Compliance was more strongly associated with age (12.1%) than with sex (8.1%) (Table 5). However, no such associations were seen in patients with GCP. Patients gave many reasons for being erratic or noncompliant with SPT, e.g., insufficient time, long traveling distances, financial problems, fear of treatment, and dissatisfaction with treatment. However, none of these factors was significantly associated with compliance (Table 6).
in those with GCP. The present data were collected for only 1 year after the active phase of periodontal therapy. Although this is a possible limitation of the study, SPT compliance for 1 year is crucial for the long-term success of such therapy (6,17). Mendoza et al. (6) found that long-term compliance is more likely if a patient is compliant during the first year of a scheduled SPT program. They also reported that the drop-out rate was highest during the first year. Compliance is lower with longer duration of follow-up (13,14).

In the present study, despite our attempts to motivate all participants to adhere to the recommended SPT, compliance was significantly better among patients with GAP (57.7%) than among those with GCP (30.6%). No earlier study has compared compliance among patients with these two distinct conditions.

Fardal et al. (18) reported that compliance was better among patients with less-severe periodontitis than among those with more-severe disease. Although aggressive periodontitis is more severe than chronic periodontitis, all of the present patients with GCP had moderate-to-severe disease. Aggressive periodontitis is rare among young people. It results in rapid periodontal destruction and is induced and aggravated by biofilm accumulation. Casarin et al. (19) suggested that patients with aggressive periodontitis are more aware of the symptoms of the disease and thus more closely adhere to oral hygiene instructions and prescribed maintenance. Adherence also depends on social and psychological factors (20), and this might help explain why GAP patients were more compliant than GCP patients. GAP leads to rapid destruction of alveolar bone, pathological tooth migration, tooth mobility, and early tooth loss, and fear of such sequelae could improve compliance.

The explanation is supported by studies by Becker et al. (8), Mendoza et al. (6), and da Silva and Castellanos (21), all of which found that underlying patient attitudes, beliefs, and values, rather than other disease characteristics, determine compliance with maintenance therapy. Philippot et al. (22) suggested that disease representation has cognitive and emotional aspects, which are constructed through direct or vicarious experiences as well as from information received from the social environment and health professionals. This may also increase compliance among patients with aggressive periodontitis.

According to Stephenson et al. (23) noncompliance is highest in people with chronic diseases, as the symptoms of such disease are usually less severe and patients are thus less motivated to adhere to instructions.

Many factors affect SPT compliance. Age, sex, type of periodontal therapy, cultural and geographic characteristics (13,14), fear of dental treatment, cost, and SES (7,12) are a few proposed factors. In this study, compliance was better among GAP patients (mean age, 28 years).

### Table 5 Results of stepwise multiple linear regression analysis of patients with GAP

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
<th>F value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.348⁺</td>
<td>0.121</td>
<td>6.888</td>
<td>0.011 (S)</td>
</tr>
<tr>
<td>2</td>
<td>0.449⁺</td>
<td>0.202</td>
<td>6.201</td>
<td>(0.004) (HS)</td>
</tr>
</tbody>
</table>

⁺ Predictor: (constant) age
⁺⁺ Predictor: (constant) age, sex
S = Significant; HS = highly significant

### Table 6 Reasons given by patients for erratic compliance and noncompliance

<table>
<thead>
<tr>
<th>Erratic compliance</th>
<th>GAP n (%)</th>
<th>GCP n (%)</th>
<th>GAP n (%)</th>
<th>GCP n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient time</td>
<td>6 (42.9%)</td>
<td>4 (33.3%)</td>
<td>2 (25%)</td>
<td>8 (36.4%)</td>
</tr>
<tr>
<td>Long distance</td>
<td>2 (14.3%)</td>
<td>2 (16.7%)</td>
<td>1 (12.5%)</td>
<td>5 (22.7%)</td>
</tr>
<tr>
<td>Economic problem</td>
<td>1 (7.1%)</td>
<td>2 (16.7%)</td>
<td>1 (12.5%)</td>
<td>4 (18.9%)</td>
</tr>
<tr>
<td>Fear of treatment</td>
<td>1 (7.1%)</td>
<td>1 (8.3%)</td>
<td>2 (25%)</td>
<td>1 (4.5%)</td>
</tr>
<tr>
<td>Dissatisfaction with treatment</td>
<td>2 (14.3%)</td>
<td>1 (8.3%)</td>
<td>1 (12.5%)</td>
<td>2 (9.1%)</td>
</tr>
<tr>
<td>Others</td>
<td>2 (14.3%)</td>
<td>2 (16.7%)</td>
<td>1 (12.5%)</td>
<td>2 (9.1%)</td>
</tr>
<tr>
<td>Chi-square</td>
<td>0.918</td>
<td>3.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>5</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P value</td>
<td>0.969 (NS)</td>
<td>0.663 (NS)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

df = Degrees of freedom; NS = Not significant
than among GCP patients (mean age, 38.2 years), and the difference was significantly associated with patient age (Table 2). Previous findings on the effect of age on compliance are inconsistent. A few studies reported that compliance was better in older patients than in younger patients (6,14,24). Other studies (13,17) found that compliance was better in younger patients, Fardal et al. (18) found no effect of age on compliance. Age might be a confounding factor that explains the better compliance among GAP patients.

Female sex was significantly associated with compliance among patients with GAP but not among those with GCP. Demetriou et al. (13) and Novaes et al. (14) found that compliance was better among women than among men. Mendoza et al. (6) found no sex difference. These conflicting findings may be due to differences in study methodology, sample size, and/or duration.

All patients in this study were treated by periodontal surgery; so the type of periodontal therapy was the same for all patients. The present study was performed in an urban institutional setting in which the population was stable and had the same cultural and geographic characteristics. Treatment was provided at very low or no cost to all patients. SPT compliance was found to be better among patients with higher SES (5,25,26). Although compliance was better among higher SES patients in the present study, the difference was not statistically significant (Table 4).

Interviews (in person or by telephone) were conducted to determine the reasons for erratic compliance or noncompliance. The most common reason was insufficient time. Other reasons included the long distance to the clinic, economic problems, fear of treatment, and dissatisfaction with treatment. None of these reasons was significantly associated with compliance. These results suggest that patient motivation to seek treatment was important in determining adherence to instructions. This supports the findings of a previous study (8), which found that people with a positive self-image had better SPT compliance.

In conclusion, SPT compliance was better among patients with aggressive periodontitis than among those with chronic periodontitis. Although it is difficult to explain this finding, patient motivation, self-belief, and attitudes are likely important factors in compliance. Further studies of this topic will require longer observation periods. In addition, a qualitative study may be useful in drawing additional conclusions.

**Conflict of interest**
The authors have no conflicts of interest to declare.

**References**

18. Fardal Ø, Johannessen AC, Linden GJ (2004) Tooth loss...


