Self-perception of Patients after Periodontal Treatment: A Longitudinal Study

Abstract

Aims: To investigate the perceptions of subjects regarding nonsurgical periodontal treatment over a period of 1 year. Settings and Design: This is a secondary analysis of a randomized clinical trial, in a longitudinal observational design. Methods: Nineteen subjects (47.24 ± 6.47 years) with moderate to severe periodontitis completed a questionnaire at two different times after a nonsurgical periodontal treatment: 30 (T1) and 390 days (T2). The questionnaire with 40 items was divided into three domains: 1-perception of changes in clinical signs of periodontal disease, 2-psychological aspects of the subject regarding their oral health status, and 3-satisfaction with the treatment. Statistical analysis: Each response on the Likert scale initially showed scores ranging from 1 to 5 points. The results for each question were dichotomized into 1 or 0, respectively, showing if the subject was favorable or unfavorable to treatment. A descriptive data analysis was performed, assessing the agreement of the results in T1 and T2 (Kappa). Results: The results generally showed a favorable perception related to the treatment and continued satisfaction over time. The exceptions were in regards to gingival recession, persistent bleeding and bad breath, and difficulty in performing the mechanical control imposed by the professional. Conclusion: It was concluded that the therapy used was satisfactory to the subjects and that a favorable perception was maintained after 1 year of follow-up.

Keywords: Perception, periodontitis, quality of life, questionnaires

Introduction

Until very recently, clinical research focused mainly on the course of periodontal disease, its diagnosis, development of appropriate treatments, as well as its clinical response. In this context, a real impact, which refers to perceptions and satisfaction of patients in relation to the treatment, has historically not been an object of interest in most investigations. However, in recent years, this topic has gradually gained attention in studies on dental health.[1] Recently, an interesting review showed that the periodontitis should not be defined only by clinical signs, but also includes the impact on general health and quality of life.[2]

In dentistry, specifically in the field of periodontology, the instruments for evaluating clinical outcomes, such as probing depth (PD), clinical attachment loss and bleeding on probing are widely accepted and used. However, in periodontal disease, inflammation and destruction of the periodontium produces a wide range of signs and symptoms that may promote important impact on everyday life or quality of life.[3] These clinical indicators fail to identify signs and symptoms that are perceived by the subject, such as pain or satisfaction with treatment, and do not report the individual’s welfare.[4]

A greater understanding about the consequences of periodontal disease, as well as its therapeutic response, is important in many aspects: in understanding the perception of patients concerning the impact of their oral health in their own lives; in periodontal care planning, which addresses the needs of patients and their main concerns; in evaluating the results of periodontal treatment from the perspective of patients; and in calling attention to the importance of periodontal care in society.[5]

Some studies have been developed to analyze the patient’s quality of life and perception after periodontal treatment.[1,6-9] Nevertheless, these are still limited in number. On the other hand, these studies do not report if subjects perceive the immediate results over time. In this sense, the purpose of this study was to evaluate if and how immediate results of nonsurgical therapy are perceived.

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by subjects, and whether this perception is maintained over time. The hypothesis is that the perception (favorable or not) can be maintained after 1 year of follow-up.

Methods

Study design

This study is a secondary analysis of a randomized clinical trial, in which all the participants received strictly nonsurgical periodontal treatment, and were followed for a period of 1 year. The sample size calculation for the study was established considering a difference in reduction of average PD of 1 mm (standard deviation ± 1 mm) with 80% power and 5% alpha. The study was reviewed and approved by the local Ethics Committee, and a written consent form was undertaken from each subject.

Briefly, 25 subjects diagnosed with moderate to severe periodontitis were treated by a periodontist (dental managed care). The characteristics of subjects before and after treatment are presented in Table 1. During the experimental period (450 days), subjects attended preventive maintenance appointments and oral hygiene instructions every 3 months.

Data collection

A printed questionnaire to assess perceptions of the subjects was administered by two trained interviewers (RR and VR) at T1 (30 days after the nonsurgical periodontal treatment) and T2 (390 days after nonsurgical periodontal treatment). The data was collected between 2008 January and 2009 October.

Instrument for data collection

The questionnaire used in this study was used previously. It contains 40 questions in Portuguese, formulated from clinical observations and opinions of specialists in periodontics. These questions are divided into three domains: Domain 1 (D1): Changes of clinical signs of periodontal disease (items 01–08); Domain 2 (D2): Psychological aspects of the patient regarding his oral health status (items 09–20); and Domain 3 (D3): Patient satisfaction with the performed treatment (items 21–40).

This instrument has an ordinal Likert scale and contains alternatives ranging from “completely agree” to “strongly disagree.”

| Table 1: Characteristics of the population before and after periodontal treatment |
|-----------------|-----------------|-----------------|
| **Subjects (mean±SD)** | **Before treatment** | **After treatment** |
| **Age (years)** | 47.24±6.47 | |
| **Gender (%)** | 13 female (72) | |
| **Smoking status (%)** | 56 smokers | |
| **Visible plaque index (%)** | 72.7±0.45 | 7.5±0.26 |
| **Gingival bleeding index (%)** | 22±0.42 | 2.1±0.14 |
| **Bleeding on probing (%)** | 72.62±3.59 | 23.69±3.15 |
| **Probe pocket depth (mm)** | 3.43±0.16 | 2.52±0.12 |

SD=Standard deviation

Data analysis

Each item response from the Likert scale was initially scored from 1 to 5. After that, these scores were dichotomized to 1 or 0, respectively, if they are favorable or unfavorable to the treatment results. A descriptive analysis of the data was performed. Internal consistency of the questionnaire was tested by Cronbach’s alpha value, and interpreted according to Bland and Altman. The correlation of results between T1 and T2 was measured by Kappa index. The interpretation of the concordance of the scale was performed according to Landis and Koch. Data was analyzed and processed with the program Statistical Package for the Social Sciences (version 18.0, SPSS PASW Inc., Chicago, IL, USA).

Results

The sample of the present investigation was composed of 25 individuals who participated in the original study. Of these, six did not participate in clinical analysis throughout the experimental period (four participants did not accept to answer the questionnaire and two were not available for the second application of the questionnaire). Thus, the questionnaires used were only those from the individuals who completed the study (n = 19), composed of 12 women and 7 men (47.24 ± 6.47 years; 73% smokers). The internal consistency of the questionnaire was considered satisfactory, with a Cronbach’s alpha of 0.690.

In relation to D1, the results showed, in general, a favorable perception of the subjects in both T1 and T2. Patients related decreased mobility of the teeth (89% of patients in T1 and 95% in T2) and dental sensitivity after treatment (84% in T1 and 95% in T2). The items that caused dissatisfaction to patients were related to increased gingival recession (item 3, 32% of patients in T1 and 53% in T2), persistent bleeding (item 7, none of the patients in T1 and 5% in T2), and bad breath (item 8, 5% of patients in T1 and 15% in T2).

Table 2 shows the correlation for D1, between T1 and T2. With the exception of items 3, 7 and 8, a positive increment in favorable perception between T1 and T2 was observed. It is possible to observe that, although there was an increase in the percentage of unfavorable response to treatment as measured by items 7 and 8, the high values of agreement between T1 and T2 show only a little increase of this unfavorable perception, meaning stability over time. In contrast, the low level of agreement observed for item 3, showed that, although already present in T1, the recession had increased and caused further dissatisfaction in T2.

Table 3 shows the correlation between the two moments of the interview for D2. Interestingly, 100% of the subjects in both T1 and T2 reported that they had learned about the causes of gum disease and its prevention. This perception is somewhat corroborated by the data showing that 95% and 100% of the patients, respectively in T1 and T2, reported...
that gum disease is caused mainly by dental plaque. Some patients reported the belief that periodontal disease will return, regardless of self-care: 5% and 21% in T1 and T2, respectively. However, although there has been an increase in this percentage in T2, it was not significant since the rate of agreement between exams was high (kappa = 0.68, \(P < 0.001\)), showing a small change.

Considering the same domain (D2), it was observed that a significant number of patients were not able to understand the importance of removing plaque versus brushing their teeth several times a day (item 17, 52% of patients in T1 and 74% in T2). This data expresses a significant increment in this perception as shown by a low correlation rate [Table 3], (Kappa 0.433). After 1 year of follow-up, the perception that the treatment was painful increased from 21% in T1-26% in T2. Although the agreement was significant, the expressed value of 0.59 [Table 3] underscores a moderate agreement, inferring that it probably had a reduced impact. With the exception of items 9, 14 and 17, the other items remained unchanged or showed a positive increment in the perception regarding the treatment in T2.

Similarly, the D3 showed a subtle improvement in the perception of the subjects after 1 year of treatment. However, subjects reported that treatment time was longer than expected (58% of patients in T1 and 68% in T2), that the mechanical biofilm control directed by the dentist required a very long time (42% of patients in T1 and 74% in T2) and it was difficult to perform (5% of patients in T1 and 11% in T2). Table 4 contains values of agreement in response between the two moments of the interview. Except for those, the other items remained unchanged or even showed a positive increase in the favorable perception of the treatment.

### Discussion

The present study sought to evaluate the perception of patients after nonsurgical periodontal treatment immediately after (30 days) and 1 year later (390 days). Overall, the results showed that the patients perceived the treatment as favorable and that this perception was maintained after a longitudinal evaluation. However, negative aspects, such as recession, were also present and reflect unfavorable aspects of the periodontal treatment.

Brauchle et al.,[9] found that periodontal disease has influence on the oral health-related quality of life. The authors applied the German version of Oral Health Impact Profile (OHIP) to 93 patients before and after periodontal treatment and showed that periodontal treatment has a positive effect on the oral health related quality of life. Nevertheless, the results are related to 6–8 weeks after treatment, and the scope of the study was not to assess the longitudinal maintenance of results over time. The OHIP was also applied by Mendez et al.[14] before, 30 and 90 days after nonsurgical periodontal treatment, and demonstrated a significant improvement in the oral health-related quality of life.

This study presents a reduced sample (\(n = 19\)), compared to the samples expressed in other studies-Lee et al.,[11] \(n = 948\); Fardal et al.,[15] \(n = 150\). However, it is worth noting that the goal of the present investigation was not to estimate the prevalence of the perceptions, but to identify and verify the maintenance of the perception over time. Thus, the limited number of studies underlying this topic and also, to the best of our knowledge, the absence of a longitudinal study evaluating the maintenance of the perception overtime, underscores the importance of the present study.

In general, instruments for assessing the perception of patients are scarce. According to Locker and Allen,[16] there is a growing need for qualitative studies to analyze the perception of patients in relation to a given treatment. Our instrument for data collection, a questionnaire containing 40 items, was previously used.[11] According to Luiz et al.[4] a questionnaire must have some fundamental characteristics: it has to be simple, understandable, reproducible, consistent and of low cost. It is believed that the present instrument

### References

1. Luiz et al.
2. Brauchle et al.
3. Mendez et al.
4. Fardal et al.
5. Lee et al.
6. Locker and Allen.
7. Luiz et al.
8. Stadler et al.

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**Table 2: Kappa index of agreement for domain 1 (perception of the patient for clinical signs of periodontal disease) between the two administrations of the questionnaire (T1 and T2)**

| Item | \(\kappa\) |
|------|----------|
| 1    | 0.796*   |
| 2    | 0.738*   |
| 3    | 0.483*   |
| 4    | 0.869*   |
| 5    | 0.688*   |
| 6    | 0.689*   |
| 7    | 0.932*   |
| 8    | 0.738*   |

\(\*P<0.001\)

**Table 3: Kappa index of agreement for the domain 2 (psychological aspects of the patient in relation to his oral health status) between the two administrations of the questionnaire (T1 and T2)**

| Item | \(\kappa\) |
|------|----------|
| 9    | 0.599*   |
| 10   | 0.630*   |
| 11   | 1*       |
| 12   | 0.932*   |
| 13   | 0.724*   |
| 14   | 0.685*   |
| 15   | 0.516*   |
| 16   | 1*       |
| 17   | 0.433*   |
| 18   | 1*       |
| 19   | 1*       |
| 20   | 1*       |

\(\*P<0.001\)
has these characteristics. Furthermore, the same authors suggest that the proposed items for the questionnaire should be distributed in predefined dimensions, involving the area being studied by the instrument. The questions of this questionnaire were grouped in three domains: D1 considered the perception of changes in clinical signs of periodontal disease (items 01–08); D2 looked at the psychological aspects of the patient regarding his oral health status (items 09–20); and D3 recorded patient satisfaction with the treatment (items 21–40).

The results from the present study are similar to others shown in literature. Fardal et al.,[15] through a cross-sectional study, identified a very low degree of discomfort after periodontal treatment, showing favorable immediate results. In our study, 100% of patients reported feeling comfortable with the treatment. Similarly, Matthews and McCulloch,[17] reported lower pain and dental sensitivity after nonsurgical treatment as compared to surgical therapy. Recently, Leung et al.[18] compared the subjective discomfort perception during nonsurgical periodontal treatment delivered with or without local anesthesia, and showed that discomfort was associated with not receiving anesthesia or noncompliance with the pain control regimen. However, those studies are designed as cross-sectional, and do not show any changes or maintenance in perception over time.

In general, in our study most of the subjects reported an improvement in self-perception considering both T1 and T2. Among the unfavorable outcomes, recession was shown as impacting on 32% of subjects in T1 and 53% in T2. It was also shown that this perception increased significantly over time [Table 2], (Kappa 0.483). It should be noted, however, that this is an expected and inherent outcome of periodontal therapy and even though this represents an unfavorable result it infers reduction or cessation of the periodontal inflammation. Considering the reduction of 1.65 mm (sites with initial PD of 4–6 mm) and of 3.59 mm (sites with initial PD 7+ mm) in PD values observed in the original clinical study,[10] it is possible to infer that the recession was, somewhat, beneficial.

Recently, a study showing how patients with periodontitis perceive the outcome after long-term supportive therapy was conducted with 281 patients with supportive periodontal therapy for up to 16 years.[19] Results suggested that patients who underwent supportive periodontal therapy for <3 years showed a higher positive perception of treatment success. Nevertheless, it was a cross-section study, and it is not possible to verify, with these results, if the satisfaction was maintained over time. Similarly, a study comparing the patients’ perception of own efforts with the clinical results showed a significant change towards positive impact following therapy. The questionnaire was also applied only once, 1 year after treatment, therefore no conclusion can be done regarding the maintenance of perception over time.[20]

In the present study a low percentage of individuals reported that mechanical biofilm control was difficult (5% of patients at T1 and 11% in T2). On the other hand, patients reported this control as time consuming (42% in T1) and this perception became greater in T2 (74%). Nevertheless, 79% (T1) and 89% (T2) of patients considered themselves able to perform the mechanical procedures and follow the dentist’s instructions. In this scenario, the fact that 95% of patients reported following the guidelines exactly as provided by the dentist, suggests that the study reached a high degree of adherence. The clinical findings from this sample showed low levels of plaque and gingivitis (average reduction of 80%) and maintenance during the experimental period[19] corroborated that the study achieved a high compliance among patients. It is known that patient compliance is critical to the success of any medical or dental intervention.[21] Likewise, the implementation, by a team, of frequent periodontal preventive maintenance is essential. In this study, patients were followed on an average of every 2.2 months. During the visits, the guidelines for oral hygiene were always reinforced.

**Conclusion**

It could be concluded that the immediate results of a nonsurgical periodontal therapy were perceived in a favorable way, and this perception, in general, was maintained after 1 year of treatment.
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Conflicts of interest
There are no conflicts of interest.

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