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Original Research

Impact of receiving periodontal treatment at least once in lifetime on oral hygiene habits and periodontal status of individuals

Muge Lutfioglu, Feyza Otan Ozden, Elif Eser Sakallioglu, Ahmet Aydogdu, Sevda Kurt

Department of Periodontology, School of Dentistry, Ondokuz Mayıs University, Samsun, Turkey

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Corresponding Author
Muge Lutfioglu
Ondokuz Mayıs University,
School of Dentistry,
Department of Periodontology,
Samsun, Turkey.
mugelutfioglu@hotmail.com

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Interdental cleaning aids; Oral hygiene; Periodontal treatment; Tooth brushing

Abstract

Objective: The aim of this study was to evaluate the impact of receiving periodontal treatment at least once in lifetime on oral hygiene habits and periodontal health status of the individuals.

Methods: The clinical records of initial examination and dental history of 97 individuals (49 male and 48 female) were determined for the present study. The comparative groups were created as: group 1, individuals received periodontal treatment previously at any periodontology or dental clinic throughout their lifetime; and group 2, individuals intended to receive periodontal treatment for the first time at Periodontology Department of Ondokuz Mayıs University Dental Faculty. The clinical records of individuals included; *(i)* Loe-Silness gingival index (GI), *(ii)* O'Leary plaque index (PI), *(iii)* bleeding on probing (BOP), *(iv)* probing pocket depth (PPD), *(v)* clinical attachment level (CAL), and *(vi)* the oral hygiene habits, *i.e.* frequency of tooth brushing and using any kind of interdental cleaning aids.

Results: PPD ($P = 0.327$), CAL ($P = 0.499$), BOP ($P = 0.282$) and GI ($P = 0.161$) were not statistically different but PI ($P = 0.037$) was significantly higher in group 2 compared to group 1. The tooth brushing ($P = 0.018$; $\chi^2 = 11.92$) and the usage of interdental cleaning aids ($P = 0.013$; $\chi^2 = 5.868$) were significantly more frequent in group 1 than group 2.

Conclusion: The present study reveals that individuals who have received periodontal treatment and instructed about oral hygiene procedures even once throughout lifetime have lower plaque indices and better oral hygiene status. Thus, the importance of the regular appointments to increase the awareness of individuals about the personal periodontal health status as well as the oral hygiene habits has been presented by this study.

INTRODUCTION

Periodontal diseases are potentially progressive bacterial infections that may lead to tooth loss as a result of the loss of periodontal attachment and alveolar bone support. The World Health Organization stated that oral diseases, including periodontal diseases are a kind of serious health problem. The worldwide awareness about the oral health should be considered as an important component of general health and quality of life [1]. Prevalence of the periodontal and/or oral diseases was reported to be more common in developing countries such as our country, compared to some parts of Europe [2, 3]. In a recent study performed on Turkish population indicated that only 15.7% of individuals between the ages of 35 and 40 had healthy periodontal tissues [4].

Accumulation of plaque is the primer etiological factor for periodontal diseases. The most important part to prevent the initiation and the progression of the disease is to understand the role of microbial dental plaque accumulation and elimination. Epidemiological studies have demonstrated that several social and demographic factors were in close relation with the periodontal health status as well as the oral health care procedures of the individuals [4-7]. Multiple reports have revealed that populations having little or no access to any form of dental care or information about oral hygiene procedures are in great risk of periodontal disease

initiation and progression [8-12]. Removal of dental plaque is an effective way to prevent the initiation of the periodontal diseases [13], and also instructing the oral hygiene procedures have important effect on periodontal health status. Therefore, improving the availability and accessibility to dental visits, and increasing the awareness and knowledge of individual periodontal problems is essential for improving the oral health status of the population [14].

Under the light of these certain statements, we designed a study to define the importance of receiving periodontal treatment at least once in lifetime on individuals' awareness of personal oral health care and also on individuals' oral health status.

MATERIALS AND METHODS

The clinical examination and dental history records of 97 individuals (49 males and 48 females with an age range of 19-70) referred to periodontal treatment at Periodontology Department of Ondokuz Mayıs University Dental Faculty, Samsun, Turkey, between September and November 2011 were evaluated in this study. All available dental information on charts of individuals was examined for choosing the appropriate subjects for the present study. The main inclusion criteria were defined as; *(i)* not having any systemic disorder and not being regular drug user, *(ii)* being at the age of ≥18, *(iii)* having at least 3 teeth for each segment (maxillary/mandibular anterior region, left side and right side of maxillary/mandibular posterior regions) of the jaws.

The records of the 97 participants were selected among 410 individuals according to the inclusion criteria as well as the proper records of personal and clinical information. The study groups were created as: group 1, individuals received periodontal treatment previously at any periodontolgy or dental clinic throughout their lifetime; and group 2, individuals intended to receive periodontal treatment for the first time at Periodontolgy Department of Ondokuz Mayıs University Dental Faculty. The clinical periodontal records of 97 subjects were included:

-*(i)* Loe-Silness gingival index (GI), classified as 0, normal gingiva; 1, mild inflammation but no bleeding on probing; 2, moderate inflammation and bleeding on probing; 3, severe inflammation and ulceration, with a tendency for spontaneous bleeding;

-*(ii)* O'Leary plaque index (PI), recording the presence or absence of disclosed plaque on the mesial, distal, buccal and lingual surfaces of all teeth and the percentage of disclosed plaque was then calculated for each participant;

-*(iii)* bleeding on probing (BOP), classified by either the presence or absence of bleeding in periodontal sulcus within 30 seconds and calculated as percentage;

-*(iv)* probing pocket depth (PPD), defined as the distance between gingival margin and periodontal pocket base as measured in millimetres by probing;

-*(v)* clinical attachment level (CAL), defined as the distance between cemento-enamel junction and periodontal pocket base as measured in millimetres by probing.

All clinical parameters except plaque index were measured on six sites of teeth (mesial, mid and distal points at buccal and palatal aspects) and were recorded with periodontal probe (Hu-Friedy Mfg. Co. Inc., Leimen, Germany).

Additionally, the oral hygiene habits as frequency of tooth brushing and using any kind of interdental cleaning aids were evaluated. The tooth brushing habit was classified as 0, never; 1, once a day; 2, two and/or three times a day; 3, once a week; 4, once a month. The usage of any kind of interdental cleaning aids was recorded as 0, not using; 1, using. The study protocol was carried out in line with the Helsinki Declaration of 1975, as revised in 2002.

Statistical analysis

A software package program (SPSS 12.0, Chicago, IL, USA) was utilized for the statistics. Shapiro-Wilk test was used to evaluate the normality of data. Data without normal distribution were evaluated by Mann-Whitney U and chi-square tests. Numerical values were given as median (minimum-maximum).

RESULTS

The median of ages (Table 1) and the distrubution of gender (24 female/28 male in group 1 and 24 female/21 male in group 2; $P = 0.544$, $\chi^2 = 0.497$) of the subjects were not statistically different among the study groups.

There were no significant difference between PPD, CAL, BOP, and GI of groups 1 and 2 ($P > 0.05$ for all). However, PI was significantly higher in group 2 compared to group 1 ($P < 0.05$, Table 1).

As shown in Table 2, the tooth brushing frequency was significantly more frequent within the subjects in group 1 compared to those in group 2. Most of the subjects in group 1 determined to have teeth brushing frequency of two or three times a day. In contrast, most of the subjects in group 2 stated to brush their teeth once a week.

The usage of any kind of interdental cleaning aids was significantly frequent within the subjects in group 1 than those in group 2 (Table 3).

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Table 1. Clinical measurements of the individuals in study groups

Parameter	Group 1, n = 45, median (min-max)	Group 2, n = 2, median (min-max)	P value*
Age	41.5 (21-70)	37 (19-64)	0.36
PPD (mm)	2.21 (1.2-3.92)	2.31 (1.37-6.54)	0.327
CAL (mm)	2.48 (1.28-4.93)	2.59 (1.37-6.54)	0.499
BOP (%)	28.72 (0-100)	29.19 (0-100)	0.282
GI	1.19 (0-3)	1.23 (0-3)	0.161
PI (%)	46.3 (0.25-100)	58.13 (5.35-100)	**0.031****

***Mann-Whitney U test; ****statistically significant

Table 2. Teeth brushing frequency of the individuals in study groups

Scale of teeth brushing frequency	Group 1 (n = 45)		Group 2 (n = 52)		Total (n = 97)	
	Subjects	%[#]	Subjects	%[#]	Subjects	%[#]
0 (never)	0	0	4	8,9	4	4.1
1 (once a day)	16	30.8	12	26.7	28	28.9
2 (two or three times a day)	23	**44.2****	9	**20****	32	33
3 (once a week)	10	**19.2****	14	**31.1****	24	24.7
4 (once a month)	3	5.8	6	13.3	9	9.3
***P value = 0.018 ; χ^2 = 11.92**						

***Chi-square test; ****significantly different between group 1 and group 2; [#]the percentages were calculated according to the n number of column

Table 3. Usage of interdental cleaning aids of the individuals in study groups.

Scale of using interdental cleaning aids	Group 1 (n = 45)		Group 2 (n = 52)		Total (n = 97)	
	Subjects	%[#]	Subjects	%[#]	Subjects	%[#]
0 (not using)	34	**65.4****	39	**86.7****	73	75.3
1 (using)	18	**34.6****	6	**13.3****	24	24.7
***P value = 0.013 ; χ^2 = 5.868**						

***Chi-square test; ****significantly different between group 1 and group 2; [#]the percentages were calculated according to the n number of column

DISCUSSION

The elimination of microbial dental plaque depends on either professional periodontal treatment or individual care and motivation. Removal of the dental plaque from tooth surfaces is important for successful maintenance of periodontal treatment as well as for preventing the initiation of periodontal diseases. The manual skills such as tooth brushing method, frequency, duration and applied power during brushing are suggested to create precious differences in the removal of plaque from tooth surfaces [15, 16]. The gender is also claimed to be effective on attitudes and behavior of a personal oral hygiene, *i.e.* females are reported to brush more frequent than males [16, 17]. In the present study, there was no significant difference between oral hygiene habits of the groups according to gender. However, the number of individuals in our study groups may be insufficient to reveal a difference about the gender. On the other hand, we did not have the opportunity to examine the manual skills because we only examined the clinical records on charts of individuals and did not evaluate the hygiene behaviors clinically.

The proper examination of periodontal tissues with evident clinical markers is an important state to determine the compliance of oral hygiene measures and periodontal status. It is evident from several studies that clinical parameters such as BOP, PPD as well as the amount of attachment loss are basic diagnostic signs revealing the periodontal condition of an individual [18-20]. In our study there was no statistically significant difference between the PPD, CAL, BOP and GI measurements of the individuals in study groups. Although dental plaque is the primary etiological factor to initiate and promote periodontal disease, long-term monitoring with examining the clinical measurements of the periodontal tissues of the individuals is important in determining the course of disease [21]. Thus the clinical parameters used in our study were accurate markers for evaluating the periodontal status of the individuals.

Beside from other clinical measurements, PI was significantly low within individuals that received periodontal treatment at least once in lifetime. The decreased amount of dental plaque accumulation may be the consequence of significantly frequent tooth

brushing and using interdental cleaning aids within the same group of individuals. The maintenance of periodontal health depends on informed and compliant individuals about the tooth brushing methods and the usage of interdental cleaning aids [14]. Correct application of the tooth brushing technique at least once a day showed to be important for preventing dental and periodontal problems caused by dental plaque accumulation [22, 23]. The prevention and management of periodontal diseases are strongly related with adequate elimination of dental plaque [23]. Periodontal treatment will fail and not even start, if individuals are not informed about the conditions of periodontal health and disease and the importance of personal attitude and behavior in the prevention and control of periodontal disease [14, 22, 24].

It has been revealed that people having greater amount of plaque on their teeth tend to experience periodontal attachment loss [25, 25]. Thus, professional periodontal maintenance programs should be regular in order to prevent periodontal disease and to improve the knowledge and the attitudes of the individuals' oral hygiene behavior [22, 26]. On the other hand, many studies have showed that periodontal treatment will be more successful when individuals are compliant for periodontal maintenance therapy as well as oral hygiene procedures [23, 24, 26-28]. In accordance with the previously published studies, the results of the present study revealed lower plaque indices, more frequent tooth brushing and using interdental cleaning aids in individuals who had previously applied periodontal treatment and are aware of oral hygiene instructions.

As a conclusion, our study suggested that individuals received periodontal treatment at least once in lifetime showed improved oral hygiene habits and more effective plaque elimination which was an important preventive factor for periodontal disease initiation and/or progression. Nevertheless, having a follow-up period is determined as an important state to make interpretation of patient prognosis about the periodontal disease, but cross-sectional pattern of the present study is considered to be the limitation of our investigation. Longitudinal clinical epidemiological studies should be performed to provide information about the critical periodontal needs of the Turkish population.

COMPETING INTERESTS

The authors report no conflicts of interest related to this study.

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