

Compliance of Referred Patients with Periodontitis to Active Periodontal Therapy: A Retrospective Study

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ABSTRACT

Aim: Periodontitis is an inflammatory, destructive condition of supporting tissues of the teeth. Nonsurgical treatment approach is relatively a long process that requires full compliance of the patient to ensure success of this treatment. This study aimed to evaluate compliance of patients with periodontitis referred to the Department of Periodontics, University of Baghdad, Baghdad, Iraq.

Materials and methods: Data were collected from records of 1,161 patients attending periodontology clinics at teaching dental hospital, Baghdad, Iraq. Patients with periodontitis were only included in the study. Set of factors potentially interfering with compliance were recorded, in addition to periodontal parameters including plaque index (PI), probing pocket depth (PPD), and bleeding on probing (BOP).

Results: Data showed significant difference in the number of referred patients according to different criteria selected in this study, such as gender, smoking, previous periodontal treatment, and history of systemic disease. The proportion of compliant patients was 30%, which is significantly lower than that of non-compliant patients (70%). In addition, results did not show any association between the degree of compliance and different factors that potentially affect compliance in the current study.

Conclusion: Degree of compliance was poor, which indicates general lack of public knowledge about the importance of periodontal therapy in controlling periodontal disease.

Clinical significance: This study highlighted the importance of increasing public knowledge about the significance of complying with periodontal treatment. This can be achieved through governmental motivational programs in Baghdad city, which will significantly improve periodontal health and reduce the overall dental cost that results from unsuccessful periodontal therapy.

Keywords: Compliance, Nonsurgical periodontal therapy, Periodontitis, Supportive periodontal therapy.

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INTRODUCTION

Periodontitis is a chronic inflammation of periodontium, which is considered as one of the main reason of tooth loss worldwide.¹ Although conventional periodontal treatment cannot restore tissue lost during the course of periodontitis, it is important to preserve the remaining tissues and natural dentition in healthy and functional state by eliminating inflammation of the attachment apparatus.² In general, periodontal treatment is relatively a long process that requires multiple session, maintenance, and frequent follow-ups to achieve desirable results.³ Success of this treatment depends largely on the commitment of the patient to attend at the scheduled appointment and following oral hygiene instructions.^{4,5}

Compliance is a term applied to patient's continuation and completion of supportive periodontal treatment.⁶ Noncompliance of patients with periodontal therapy is mostly attributed to the chronic and painless nature of periodontal disease.⁷ This notion has been supported by previous studies that indicated that only few patients were completely complying with periodontal treatment.^{8,9} Generally, patients were found to comply better when well informed and motivated by clinic personnel during treatment visits.⁹ Instructions given to the patient are considered as a key factor in success of treatment and long-term prognosis of any chronic disease, such as periodontitis.^{10,11} Unfortunately, global compliance with treatment of any chronic condition was estimated to be less than 50% according to report of the World Health Organization.¹² Noncompliance of periodontal patients results in poor treatment outcomes and an increased incidence of root caries.^{8,13-15} Delatola et al¹⁶ have reported that out of 427 patients, only 46 patients agreed to initiate periodontal therapy, but they did not complete it. While 89 patients initiated and completed the active phase of treatment, this suggested a low compliance of patients with active periodontal therapy. Another retrospective study, based on computerized records of 300 adult chronic periodontitis patients, showed that 32% were compliers, 46% were noncompliers, and 22% were erratic attenders.¹⁵ Furthermore, Ojima et al¹⁴ found that 26% of patients did not comply with their first visit for periodontal maintenance.

For periodontal patients, treatment is essential to prevent the progression of periodontal disease and

inevitable tooth loss, as well as to prevent any systemic complications that could be associated with periodontal disease. In addition, a 10-year study was conducted by Pretzl et al,¹⁷ which showed that compliance with non-surgical periodontal treatment significantly reduced the cost of dental treatment. Noncompliance could be due to a variety of factors, some related to the patient including fear of pain, anxiety, lifestyle, low self-esteem, and embarrassment^{14,18-21} or external factors, such as the community or providers.²² A previous study that included 414 patients indicated that no significant relation was found between the degree of compliance with gender, recall schedule, or type of treatment procedure performed. However, younger patients were more compliant than older subjects.²³

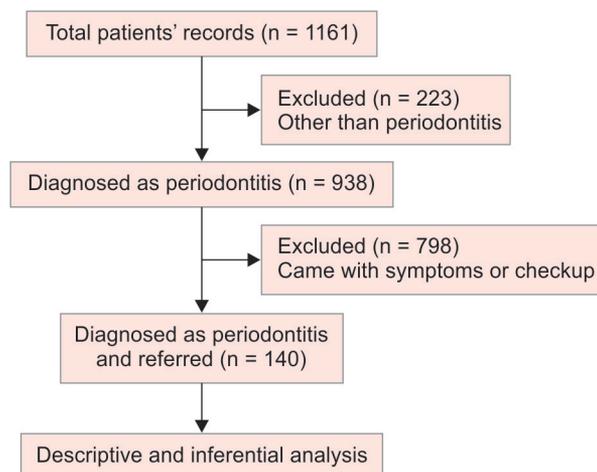
Based on previously reviewed studies, it can be concluded that the noncompliance of the patients is a well-recognized problem, and it continues to be a major obstacle to achieve appropriate care that ensures patients' health and well-being. Since no data are available about compliance of the patients with periodontal therapy in Baghdad city, this study was carried out to evaluate the compliance of patients, attending periodontics clinic in Baghdad dental hospital, to active periodontal therapy.

MATERIALS AND METHODS

This work is a retrospective study. The target population consisted of patients who attended the dental hospital of College of Dentistry, University of Baghdad, Baghdad, Iraq, and referred to the clinics of periodontics department from other departments in the period from 2014 to 2017. No ethical approval from relevant ethical committee was mandatory due to the retrospective nature of this study. A total of 1,161 patients' records were collected from clinics of periodontics department after granting the approval to start the study by the scientific committee of Periodontics Department, College of Dentistry, University of Baghdad, Baghdad, Iraq. Six independent reviewers received patients' records and blindly collected the data.

The reviewers were asked to consider patients who have been diagnosed with periodontitis only and have been referred from other departments (Flow Chart 1). Diagnosis was determined after consideration of both clinical periodontal examination, full-mouth PPD measures of six sites per tooth, and radiographic examination (periapical radiographs and/or panoramic radiographs). Information of patients was collected from the records including the age, gender, smoking, bruxism, use of interdental aids, presence of systemic disease, previous periodontal treatment, and number of visits. Moreover, periodontal parameters were recorded including PI, PPD, and BOP. All patients' names were number coded and uncovered to the statistician and authors.

Flow Chart 1: Flow diagram of the study



The number of visits during active phase of periodontal treatment was determined for each patient to evaluate his/her compliance. Patients who only attended first visit were considered as noncompliers, while patients who attended the next visits were considered as compliers to active periodontal treatment.

Descriptive and inferential data analysis were carried out using Statistical Package for the Social Science software version 19 (IBM Corp, Armonk, NY, USA). Chi-square test ($p < 0.05$) was used to compare between the frequencies of variables. The association between non-parametric variables was determined by cross-tabulation and chi-square test ($p < 0.05$). Comparison between parametric variables was carried out by paired t-test ($p < 0.05$) regardless of data distribution because of large sample size as described by Kwak and Kim.²⁴

RESULTS

Referred patients with periodontitis from other departments were subdivided according to different criteria (Table 1). Analysis showed significant difference ($p < 0.05$) in referred patients in terms of smoking status, gender, parafunctional occlusal force, systemic disease, whether the patient underwent previous periodontal treatment, and use of interdental aids. Majority of these patients did not comply with treatment (70%), which is significantly higher than patient who attended more than one visit (30%) (Table 2). However, results indicated a significant difference ($p < 0.05$) in the number of compliant patients to active periodontal treatment according to different criteria between the first visit and the second visit, except for patients with bruxism and systemic disease (Table 3). However, further analysis failed to show the presence of any association between different factors included in this study and the degree of compliance of patients with periodontal treatment (Table 3).

For compliant patients, it was feasible to measure different periodontal parameters in the second visit,

Table 1: Descriptive analysis of referred patients diagnosed as periodontitis

		Age (SD)	n (%)	p-value*
Smoking	Nonsmoker	49.66 (14.199)	88 (62.9)	0.002
	Smoker	48.88 (10.110)	52 (37.1)	
Gender	Male	51.30 (12.244)	94 (67.1)	0.000
	Female	45.33 (13.098)	46 (32.9)	
Bruxism	No	49.31(13.115)	130 (92.9)	0.000
	Yes	50.10 (7.810)	10 (7.1)	
Use of interdental aids	No	49.38 (12.993)	112 (80.0)	0.000
	Yes	47.50 (13.780)	28 (20.0)	
Systemic disease	No	47.15 (12.698)	104 (74.3)	0.000
	Yes	55.94 (10.767)	36 (25.7)	
Previous periodontal treatment	No	49.67 (13.284)	85 (60.7)	0.000
	Yes	48.91 (12.234)	55 (39.3)	

*Comparison by chi-square at $p < 0.05$; SD: Standard deviation

Table 2: Compliance for referred patients diagnosed as periodontitis

		Age (SD)	n (%)	p-value*
Visits	Only 1 visit	47.96 (12.574)	98 (70.0)	0.000
	>1 visit	52.73 (12.824)	42 (30.0)	

*Comparison by chi-square at $p < 0.05$; SD: Standard deviation

such as PPD and BOP. The average PPD was equal to 4 mm, which indicates that a majority of referred patients were suffering from mild periodontitis associated with relatively low BOP percent (about 16%) of total surfaces examined (Table 4). In addition, the PI score showed significant reduction ($p < 0.05$) between the first visit and the second visit for patients who comply with the active phase of periodontal treatment (Table 5).

DISCUSSION

Periodontal disease is generally initiated by the presence of bacterial plaque which is started as inflammation of gingival tissue and progresses later to include other parts of periodontium that ends with loss of teeth.¹ Periodontal treatment is a multistage therapy that requires cooperative patients to comply with scheduled visits and follow given oral hygiene instructions to restore health and prevent further progression of periodontal disease.^{2,6} Thus, this retrospective study was designed to evaluate the compliance of patients with periodontitis referred to the Department of Periodontics, University of Baghdad.

Referred patients diagnosed with periodontitis were classified into different categories according to factors that may affect the compliance. Analysis showed that

Table 3: Comparison and association of descriptive parameters of referred patients diagnosed as periodontitis with attended visits

		Compliance category		Total n (%)	Comparison* p-value	Association** p-value
		1 visit only n (%)	>1 visit n (%)			
Smoking	Nonsmoker	61 (46.6)	27 (19.3)	88 (62.9)	0.000	0.819
	Smoker	37 (26.4)	15 (10.7)	52 (37.1)	0.002	
Gender	Male	66 (47.1)	28 (20.0)	94 (67.1)	0.000	0.937
	Female	32 (22.9)	14 (10.0)	46 (32.9)	0.008	
Bruxism	No	90 (64.3)	40 (1.4)	130 (92.9)	0.000	0.474
	Yes	8 (5.7)	2 (1.4)	10 (7.1)	0.058	
Interdental aids	No	78 (55.7)	34 (24.3)	112 (80.0)	0.000	0.854
	Yes	20 (14.3)	8 (5.7)	28 (20.0)	0.023	
Systemic disease	No	76 (54.3)	28 (20.0)	104 (74.3)	0.000	0.177
	yes	22 (15.7)	14 (10.0)	36 (25.7)	0.182	
Periodontal treatment	No	60 (42.9)	24 (17.8)	84 (60.7)	0.000	0.296
	Yes	38 (27.1)	17 (12.1)	55 (39.3)	0.005	

*Comparison by chi-square at $p < 0.05$; **Association by chi-square at $p < 0.05$

Table 4: Severity of periodontal disease in referred patients diagnosed as periodontitis (second visit records)

PPD	Surfaces with PPD (%)					Average PPD	Surfaces with bleeding	Percent BOP	Total surfaces
	4 mm	5 mm	6 mm	7 mm	>7 mm				
189	97	39	4	5	334 (3.18)	4.361	1777	16.91	10508

Table 5: Comparison of mean PI of referred patients diagnosed as periodontitis between first and second visits

	Mean (SD)	n	p-value*
First visit PI	1.59 (0.630)	42	0.000
Second visit PI	1.13 (0.505)	42	

*Paired t-test at $p < 0.05$; SD: Standard deviation

the number of smoker patients was significantly higher than that of nonsmokers, which is a logical finding as smoking is associated with deterioration of periodontal health status.²⁵ Referred males were higher in number than referred females, which is also consistent with previous studies which suggested that females show more concern for their periodontal health than males.²⁶ Unexpectedly, the number of patients who underwent previous periodontal treatment was significantly higher than the number of patients who had no history of periodontal therapy. This may indicate noncompliance of former patients to active or supportive periodontal treatment, which agrees with previous studies.^{4,8,9,23} The same unexpected pattern was observed with referred patients using interdental aids who were significantly higher in number than those not using any kind of interdental aids. This could be explained by improper use of interdental aids usually associated with loss of attachment and impaction of plaque in gingival crevice when improperly used.^{27,28} The proportion of compliant patients was only 30%, which is significantly lower than that of noncompliant patients (70%); this agrees with previous studies that indicated that compliance of patients to periodontal treatment at dental hospital setting is about 25%.^{8,12}

Findings of the current study showed that patients with systemic disease were less compliant as compared with healthy individuals. This is similar to the results from previous study which suggested that medically compromised patients were noncompliant to treatment of life-threatening condition, thereby they would show ignorance to less painful and chronic disease, such as periodontitis.^{29,30} Similarly, patients who showed signs of bruxism were less compliant than patients with no bruxism. This could be attributed to the fact that bruxism is mostly related to stressful lifestyle that consequently makes the individual indifferent about his/her general and dental health.^{31,32} However, results about the effect of other factors on compliance of patients did not show any significant difference between compliant and noncompliant patients, such as smoking, gender, and experience with periodontal treatment. Although smoker patients were considered as noncompliant by many studies,^{8,12,33,34} data of our study did not show any significant difference in compliance between smokers and nonsmokers. Such a difference could be attributed to difference in sample size and difference in the period of follow-up. Further,

results also indicated that gender cannot be considered as a reliable predictive factor for compliance of patient which is in agreement with other studies.^{12,16} On the contrary, other studies suggested that female are more compliant than male counterparts.^{5,35} Again, this variation could be due to differences in sample size examined or cultural differences.

Nevertheless, our study could not find any association between different factors investigated and noncompliance of patients. This could be due to other factors, which were not included in this study, such as long and tedious nature of periodontal treatment, anxiety, and lack of proper motivation given by the dental practitioner. Another major factor that should be considered is the incremental costs potentially caused by noncompliance to treatment, which was indicated by many studies worldwide.^{36,37} This reason was excluded in current study, as the treatment is free in the teaching hospital. Interestingly, this could be the reason for noncompliance due to general attitude in our community that anything free would be of low quality. Despite that, untreated periodontitis would eventually lead to loss of teeth that requires replacement with bridge or dental implant work that definitely would cost more than successful nonsurgical periodontal therapy.¹⁷ Other factors potentially that affected the compliance could be that majority of patients attending teaching hospital belong to low socioeconomic level category, mostly unemployed, who prefer to look for job rather than wasting time to comply with treatment. The other employed patients could face difficulty in complying with treatment visit, scheduled in the morning, as they cannot have regular weekly leave from their work to attend to the clinic. However, this study monitored periodontal health status of patients complying with treatment over a relatively short period. Yet, plaque scores showed significant reduction between first and second visits for compliers, which is in accordance with other studies that emphasize the importance of commitment of patient to treatment in controlling dental plaque at low level.^{8,36,38} Intriguingly, a majority of referred patients were suffering from mild-to-moderate periodontitis, while patients with severe form of periodontitis were the least referred patients. This indicates the unawareness of the patients to the existence of serious periodontal problem at early stages unless diagnosed by a dentist, which is mostly due to chronic and painless nature of periodontal disease that could further affect the compliance of the patients.⁷

Limitations of this study included lack of calibration between periodontists who have treated referred patients. Such a limitation might have an impact in recording clinical parameters and biased the results. However, inferential analysis was only carried out for mean PI using paired t-test. The same periodontist recorded the mean PI

in the first and second visits for a particular patient and this might minimize any operator bias. Lack of information about the socioeconomic status of patients included in this study was another limitation, which might have biased the outcomes. Nevertheless, majority of patients who have attended dental hospital were representing the low-class inhabitants of Baghdad city.

CONCLUSION

Results of this study indicated poor compliance of patients with active phase of periodontal therapy, which suggested that noncompliance is a dominant behavior among patients undergoing periodontal treatment. This attitude is multifactorial and cannot be attributed to a single predictive factor.

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