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Original Research Article

Effects of Age, Gender and Educational Level on the Severity of Chronic Periodontitis.

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Abstract

Chronic periodontitis is a multifactorial disease causing destruction of the supporting tissues of the teeth. The most important causing factor of chronic periodontitis is dental plaque however different systemic, environmental and behavioral factors may associate with this disease. The aims of this study were to evaluate the effects of different variables on the severity of chronic periodontitis and their effects on clinical periodontal parameters.

A questioner including: age, gender and educational level was taken from (550) patients with chronic periodontitis and they were systemically healthy, also clinical periodontal parameters were obtained from each patient. The patients categorized into different groups according to the age, gender and educational level and the percentages of mild, moderate and severe periodontitis were calculated for each group. Also, clinical periodontal measurements were compared among groups.

Statistical analysis revealed that the highest percentages of severe chronic periodontitis cases were found in male, with primary education and (50-59) age groups. Also, statistically significant differences among all groups of different variables were shown in all clinical periodontal measurement.

All of the variable including: age, gender and education may affect the severity of chronic periodontitis.

Key Words: chronic periodontitis, age, gender, educational level.

تأثيرات العمر والجنس والمستوى التعليمي على شدة التهاب اللثة المزمن

الخلاصة

التهاب اللثة المزمن هو مرض متعدد العوامل يسبب تدمير للأنسجة الداعمة للأسنان. أهم عامل مسبب لالتهاب اللثة المزمن هو البكتريا ولكن العوامل العامة والبيئية والسلوكية المختلفة قد ترتبط مع هذا المرض. هدفت هذه الدراسة إلى تقييم آثار المتغيرات المختلفة على شدة التهاب اللثة المزمن وتأثيراتها على الفحوص السريرية للثة.

مجموعة اجوبة تتضمن العمر و الجنس ومستوى التعليم اخذت من (٥٥٠) مريض ممن يعانون من التهاب اللثة المزمن ويتمتعون بصحة جيدة ، كما تم الحصول على الفحوص السريرية للثة من كل مريض. كذلك تم تصنيف المرضى إلى مجموعات مختلفة حسب العمر والجنس والمستوى التعليمي وتم حساب نسب التهاب اللثة البسيط والمعتدل والشديد لكل مجموعة. كما تم مقارنة قياسات اللثة السريرية بين المجموعات.

كشف التحليل الإحصائي أن أعلى النسب المئوية لحالات التهاب اللثة المزمن الشديد وجدت في الذكور وذوي التعليم الابتدائي ومرضى الفئات العمرية (٥٠-٥٩). كما ان جميع الفحوص السريرية للثة أظهرت فروق ذات دلالة إحصائية بين المجاميع.

كل المتغيرات التي تشمل : العمر والجنس والتعليم قد تؤثر على شدة التهاب اللثة المزمن .

الكلمات المفتاحية: التهاب اللثة المزمن، العمر، الجنس، المستوى التعليمي.

Introduction

Periodontal diseases are group of chronic infectious diseases resulting in inflammation of gingival and/or periodontal tissues with progressive loss of alveolar bone that include two basic forms gingivitis and periodontitis [1].

Chronic periodontitis (CP) is one of the two major dental diseases that affect human populations worldwide at high prevalence rates [2]. There is a global variation in the prevalence, severity, and progression of periodontitis [3,4]. The prevalence of periodontitis is 5–15% of adults globally [4] with some geographic variation; for example, in Asia the prevalence is as high as 15–20% [5]. Some 9% of the United Kingdom population suffers from advanced peri-odontitis according to the 2009 Adult Dental Health Survey [6]. Currently, there are no dependable tests to diagnose and predict progression of periodontitis. The diagnosis of chronic periodontitis is depend on clinical examination which include clinical

attachment level, probing depth and alveolar bone condition; as well as the diagnosis depend on the radiographic assessment [7].

The main etiological agent of periodontitis is considered to be the dental biofilm [8]. However, multiple causal factors like stress, hormonal change, smoking, medications, genetics, diabetes mellitus and poor nutrition that interfere with the body's immune system play a major role in the pathogenesis of chronic periodontitis [9-13].

Materials and Methods:

This cross-sectional study included 550 systemically healthy subjects suffering from chronic periodontitis , the ages of them were more than twenty years old and they were coming to the College of dentistry-University of Babylon asking for periodontal treatment. In addition to the examination, a questionnaire including dental health and systemic health was used. The questionnaire involved information such as age, gender and educational level. All chronic periodontitis patients in this study were grouped into five age groups with age range from (20) to above (60) years. Also, the patients categorized according to gender and educational level. The patients must have at least (20) teeth and 30% or more of the sites assessed in the mouth demonstrate clinical attachment loss (CAL) ≥ 1mm.

Periodontal examinations were performed in department of periodontology in College of dentistry/ University of Babylon. The periodontal measurements recorded were the following:

Plaque index (PI) [14], gingival index (GI) [15], probing pocket depth (PPD), bleeding on probing (BOP) [16] and clinical attachment loss. Clinical attachment loss, was used to categorized the patients in to three groups according to severity as (mild, moderate and severe) [1].

Mild chronic periodontitis: include cases with clinical attachment loss of 1-2mm.

Moderate chronic periodontitis: include cases with clinical attachment loss of 3-4mm.

Severe chronic periodontitis: include cases that have clinical attachment loss of (≥5mm).

Probing pocket depth was measured as the distance from the base of the crevice/ periodontal pocket to the gingival margin, it measured in millimeters; clinical attachment loss was calculated as the distance in millimeters from cementoenamel junction to the bottom of the crevice/periodontal pocket. All clinical periodontal parameters were taken from four sites of the tooth (buccal, lingual, mesial and distal surfaces). The parameters were taken from all teeth that present in the mouth, except third molars. The study variables were statistically analyzed using Statistical Process for Social Science (SPSS version 20) by using mean, percentage, student t-test, chi-square test (X^2) and analysis of variance test (ANOVA). Chi-square test was selected to test the comparison of the percentages of BOP among groups. Analysis of variance test was used to compare the means of (PI, GI and PPD) in different age and education level groups, while t-test was used to compare the means of these parameters in male and female groups. The level of significant was accepted at $P \leq 0.05$ and highly significant when $P \leq 0.001$.

Results:

This study revealed that the highest percentage of patients with chronic periodontitis was found in (50-59) age group, the highest percentage of mild chronic periodontitis (29%) was found in (40-49) age group while highest percentages of moderate and severe chronic periodontitis were found in (50-59) age group as shown in table 1.

Regarding clinical periodontal parameters, (20-29) age group had the highest means of plaque and gingival indices also had the highest percentage of bleeding on probing with highly significant differences among different age groups, while the highest mean of PPD were found in (≥60) age group as shown in table 2.

Regarding gender, male patients who suffering from chronic periodontitis were more than female patients and the mild cases of chronic periodontitis were higher in female than male patients, while moderate and severe cases were higher in male than female patients with statistically high significant difference as shown in table 3.

Table (1): Distribution of chronic periodontitis according to severity in different age groups.

Age groups	Total patients with CP	mild	moderate	severe	X^2	P- value
20-29	45 (8%)	25(16%)	15(8%)	5 (2%)		
30-39	100 (18%)	40(25%)	38 (21%)	22 (10%)		
40-49	170 (31%)	45(29%)	54(30%)	71(34%)		
50-59	185(34%)	43(27%)	56 (31%)	86(41%)	50.288	< 0.001
≥60	50 (9%)	4 (3%)	18 (10%)	28 (13%)		
Total patients with CP	550	157	181	212		

Table (2): Clinical periodontal parameters of different age groups.

Age groups	PI	GI	bop	PPD
20-29	2.34	2.47	2500 (46.3%)	3.87
30-39	2.21	2.42	4000 (37.03%)	4.34
40-49	1.75	2.03	700 (41.17%)	4.51
50-59	2.25	1.91	6500 (39.93%)	4.86
≥60	2.22	1.85	1650 (39.29%)	4.91
P-value	< 0.001	< 0.001	< 0.001	< 0.001

Table (3): Distribution of chronic periodontitis according to severity in male and female groups.

Gender	Total patients with CP	mild	moderate	severe	X^2	P- value
Male	345 (63%)	70 (45%)	125(69%)	150(71%)		
Female	205 (37%)	87 (55%)	56 (31%)	62 (29%)	31.0483	< 0.001
Total patients with CP	550	157	181	212		

The results also showed that female group had lower means of (PI, GI and PPD) and lower percentage of BOP than male group with highly significant difference shown in table 4. The results of our study also revealed that the lowest percentage of chronic periodontitis were found in group of the patients with high education, also the majority of the cases in this group was mild while the highest percentages of moderate and severe chronic periodontitis cases were found in group of the patients who received primary education only as shown in table 5. All clinical periodontal parameters (PI, GI, BOP and PPD) showed the highest measurements in group of the patients with primary education with highly significant differences among groups as shown in table 6.

Table (4): Clinical periodontal parameters of male and female groups.

Gender	PI	GI	BOP	PPD
male	2.25	2.34	13340 (42.03%)	4.8
female	2.05	1.92	8310 (37.53%)	4.2
P- value	< 0.001	< 0.001	< 0.001	< 0.001

Table (5): Distribution of chronic periodontitis according to severity in different educational achievement groups.

Education	Total patients with CP	mild	moderate	severe	X^2	P- value
Primary	224 (40.7%)	23 (14.6%)	95 (53%)	106 (50%)	66.012	< 0.001
Secondary	201 (36.6%)	75 (47.8%)	55 (30%)	71 (33.5%)		
High	125 (22.7%)	59 (37.6%)	31 (17%)	35 (16.5%)		
Total patients with CP	550	157	181	212		

Table (6): Clinical periodontal parameters of different educational achievement groups.

Education	PI	GI	BOP	PPD
primary	2.77	2.40	10000 (48.52%)	4.8
secondary	1.89	2.04	7188 (35.76%)	4.6
High education	1.78	1.98	4462 (33.05%)	4.1
P- value	<0.001	<0.001	<0.001	<0.001

Discussion:

Periodontitis is an inflammatory disease affecting the supporting tissues of the teeth. Periodontal diseases are classified as complex disorders where individual, environmental, behavioral and genetic factors contribute to their etiology. This study reports the effects of different factors on the chronic periodontitis severity and on the clinical periodontal parameters.

The results of this study showed that the severity of chronic periodontitis increased with age also it showed that the mean of PPD increase with age, this result were in agreement with Singh *et al*. [17].

Age itself does not affect the periodontal status but it is the cumulative effect of untreated disease reflecting the effect of the age on disease severity [18, 19].

In spite of many studies that revealed the association of the increased prevalence of periodontitis with age, a study performed by Abdellatif *et al* reported that the high prevalence of chronic periodontitis was found in the poor-oral hygiene subjects rather than in the good oral hygiene one when the subjects grouped according to the oral hygiene status. So when the good oral hygiene measures were performed, the effect of age on the severity and the progression of chronic periodontitis could be considered unaccountable. As a conclusion of other study, the authors reported that age represent a correlate not a risk factor and that chronic periodontitis is mainly associated with oral hygiene condition of the subjects [20].

This study through its results revealed that the majority of the cases of chronic periodontitis involved male patients (63%), also the majority of the severe cases occur between male (71%), while the highest percentage of mild chronic periodontitis was found in female group. These results were in

agreement with a study performed in Brazil by Meusel *et al*. [21].

Also male patients associated with higher scores in all clinical periodontal parameters (PI, GI, BOP and PPD), these results were in agreement with [22, 23].

On the other hand other study performed by Aljohani revealed that female associated with higher percentage of chronic periodontitis than male patients [24].

Regarding educational level our study showed that the percentages of chronic periodontitis decrease as the level of education increase and the highest percentages of both moderate and severe chronic periodontitis were found in patients with primary education only. Similar results were found by other study performed by Meusel *et al*., it reported that disease severity was significantly associated with number of years spent at school, i.e., severe periodontitis was more prevalent among participants with less education (<8 years) [21]. This result may be attributed to the unawareness about oral health measures or may be attributed to the low socioeconomic levels of those patients. Other study performed by Zini *et al.* presented a potential explanatory pathway for the relationship between socio-economic position and CP. Low level of education was proposed as a distal determinant, leading to tobacco smoking and higher levels of plaque, and finally to CP [25].

Conclusion

Severity of chronic periodontitis significantly increased in old age, male gender and low educational level groups and all clinical periodontal parameters including (PI, GI, BOP and PPD) were higher in those groups than that in young age, female gender and high educational level groups.

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