

RELATIONSHIP BETWEEN PSYCHO-EMOTIONAL STRESS AND PERIODONTAL DISEASE

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ABSTRACT

Introduction. The severity and nature of periodontal disease depend on a number of factors. An important place is occupied by the general condition of the body, the presence of systemic diseases, environmental influences, and chronic stress and so on. A number of clinical studies have examined the possible relationship between psychological stress and periodontal disease.

Objectives. To determine the influence of psychosomatic state on periodontal tissues of the examined residents.

Material and methods. To conduct the study, a questionnaire of 350 residents of Kyiv and several other cities of Ukraine was conducted. Diagnosis of anxiety self-assessment was performed by determining the Spielberger-Khanin test of reactive and personal anxiety and DASS-21. The subjects examined the oral cavity and assessed the condition of the periodontium.

Results. A higher level of systemic diseases was found in residents with insufficient living conditions. It also affected the higher level of personal anxiety of residents. High levels of personal anxiety affect the prevalence and structure of periodontal disease. Thus, the study of the impact of psychoemotional stress on the course of periodontal disease and further development of appropriate schemes of rational treatment of periodontal disease (periodontitis) in people with psychoemotional stress.

Conclusions. Analysis of the levels of reactive anxiety in the subjects depending on the presence and type of periodontal diseases showed that the subjects with the presence of chronic gingivitis, the level of reactive anxiety was quite moderate. A slightly higher level of reactive anxiety was found in patients with periodontitis. The level of personal anxiety is higher if the subjects have periodontitis.

Key words: periodontal diseases, reactive and personal anxiety

Introduction

The prevalence of periodontal disease in different countries is almost equally high, except in some regions of Asia. Among the population of Ukraine aged 35-44 years and older, the prevalence of periodontal disease ranges from 92% to 98% [1]. Particularly alarming is the tendency to increase the total number of patients with periodontitis among young people, which reaches 60% [2].

The severity and nature of periodontal disease depend on a number of factors. An important place is occupied by the general condition of the body, the presence of systemic diseases, environmental influences, and chronic stress and so on. A number of clinical studies have examined the possible relationship between psychological stress and periodontal disease. It has been suggested that stress may play a provocative role in the development of periodontal disease. In particular, people who are in a state of psychological stress are more prone to the development of periodontitis [3, 4].

Interesting results of the study were obtained in the case of studying the effects of psychological stress on young people [5, 6]. The researchers concluded that the possible negative impact of psychological stress on the condition of periodontal tissues in young people [7]. Measuring anxiety as a personal quality is especially important, because this quality largely determines the behavior of the subject. A certain level of anxiety is a natural and obligatory feature of an active personality [8, 9].

Given these circumstances, it was of interest to determine the possible relationship between the psychosomatic state of the inhabitants and the state of their periodontal tissues.

Objectives

To determine the influence of psychosomatic state on periodontal tissues of the examined residents.

Material and methods

To study the subjective reactions of man to the action of various environmental factors, it is advisable to use specially designed questionnaires. The advantage of the questionnaire over other methods is the ability to obtain significant amounts of empirical information in a short time.

To conduct the study, a questionnaire of 350 residents of Kyiv and several other cities of Ukraine was conducted. A special questionnaire was developed for the survey, in which respondents noted their living conditions, health status and gave them their subjective assessment. Among those surveyed, persons aged 18-45 years predominated, only a small number of them (35 people, 12.0%) were under 60 years of age. The majority of respondents were women - 221 (63.14%) women and 129 (36.86%) were men.

Diagnosis of anxiety self-assessment was performed by determining the Spielberger-Khanin test of reactive and personal anxiety and DASS-21 [8, 9, 10]. These tests allow you to assess the state of emotional stress and determine its level (depression, anxiety, stress). Reactive and personal aspects of anxiety were evaluated.

The subjects examined the oral cavity and assessed the condition of the periodontium. For this purpose, the Schiller-Pisarev test was used. Evaluation of the hygienic condition of the oral cavity was performed using the hygienic index by Fedorov-Volodkina and the Green-Vermillion index (1964). The PMA index was used to determine the degree of gingival inflammation [2]. When diagnosing used the classification of periodontal disease by M.F. Danilevsky (1994) and classification scheme for periodontal and peri-implant diseases 2017 [11, 12].

Statistical processing of the obtained results was performed in the package "STATISTICA 6.1" using parametric and nonparametric methods. The correctness of the distribution of traits for each of the variation series, the average values for each trait and their standard errors and deviations were evaluated [13].

Results

The study showed that some of the subjects had an increased level of personal anxiety, which is quite closely related to the living conditions of the subject. There is a combination of several factors: living conditions, the presence of systemic diseases and personal anxiety. According to the literature data, taking into account a certain priority of these factors, it is possible to build a certain dependence in the following sequence: unsatisfactory living conditions, increased level of personal anxiety and increased level of systemic diseases. In the future there is a vicious circle, when the

presence of systemic disease further exacerbates personal anxiety, which leads to an increase in the level of systemic morbidity.

Situationally stable manifestations of anxiety (personal anxiety) are a stable individual characteristic of the person. It reflects the subject's tendency to anxiety and suggests that he has a tendency to perceive a wide range of situations as a threatening condition, responding to each of them with a certain reaction. As a predisposition, personal anxiety is activated by the perception of certain stimuli, and is regarded by a person as dangerous, associated with specific situations, threats to his personality and body.

People with high levels of personal anxiety tend to perceive the threat to their lives in a wide range of situations and react very intensely, with a pronounced state of anxiety. The behavior of such a person becomes unpredictable, because everything new is perceived as unknown. Such an attitude can cause, under appropriate conditions, an even greater surge of anxiety and, consequently, an even greater increase in morbidity.

Thus, a certain relationship was established between living conditions and the level of morbidity of the subjects. The level of reactive anxiety under different living conditions and the presence of diseases is almost the same. It is noted that the presence of diseases increases the level of personal anxiety of respondents. Significant (<0.05) differences in indicators of personal anxiety in the presence of diseases depending on living conditions.

Determination of the periodontium status was also conducted in the respondents during the survey. It was conducted and analyzed the results obtained according to the such groups: Group I - 197 (56.29%) people who positively assessed their living conditions and Group II - 153 (43.71%) people who lived in unsatisfactory from their point of view conditions.

As a result of periodontal examination in 197 respondents who positively assessed their living conditions, periodontal disease was revealed in 157 of them - 79.69%. In 153 people who lived in unsatisfactory from their point of view conditions, periodontal disease was revealed in 145 of them - 94.77% (Table 1). There was a significant ($p < 0.05$) statistical difference between the prevalence of periodontal disease in these groups.

Table 1
Prevalence of periodontal diseases in respondents (%)

Group	Quantity	Gingivitis		Periodontitis		Prevalence	
		abs.	%	abs.	%	abs.	%
I group	197	38	19,29±1,7*	119	60,41±6,5*	157	79,69±6,7*
II group	153	11	7,19±0,9*	134	87,58±6,9*	145	94,77±7,6*

* - reliability ($p < 0, 05$) between the data of I and II groups of surveyed residents

Graphically, this is presented in Fig. 1, 2. 

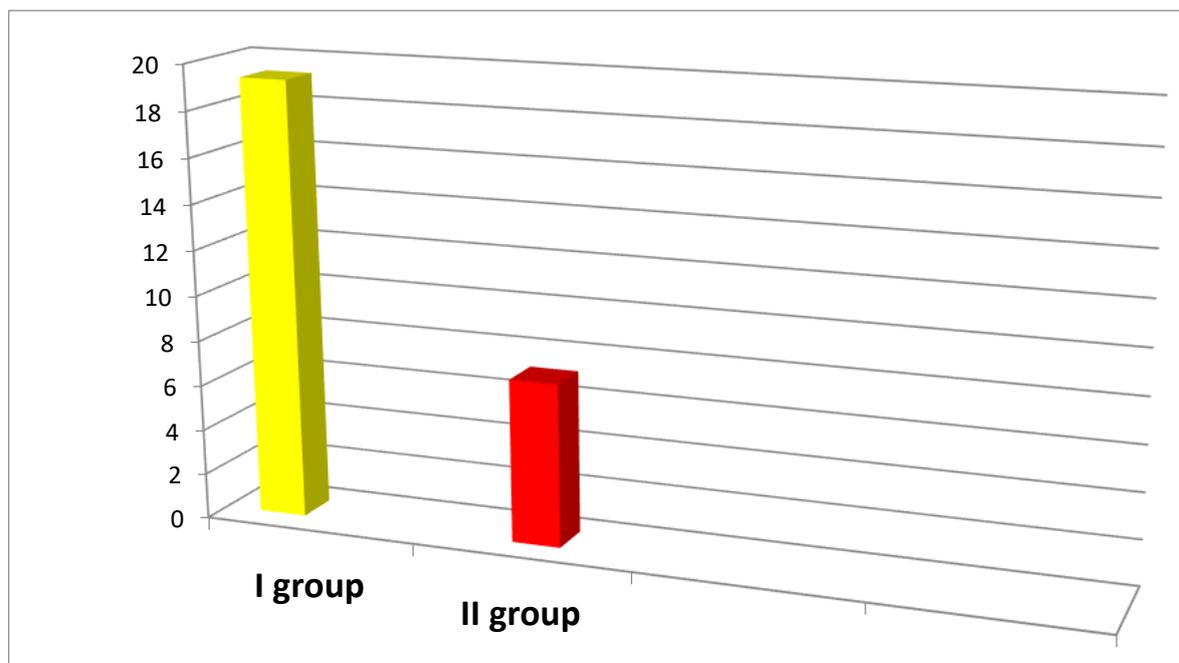


Fig. 1. Graphic representation of the prevalence of chronic gingivitis

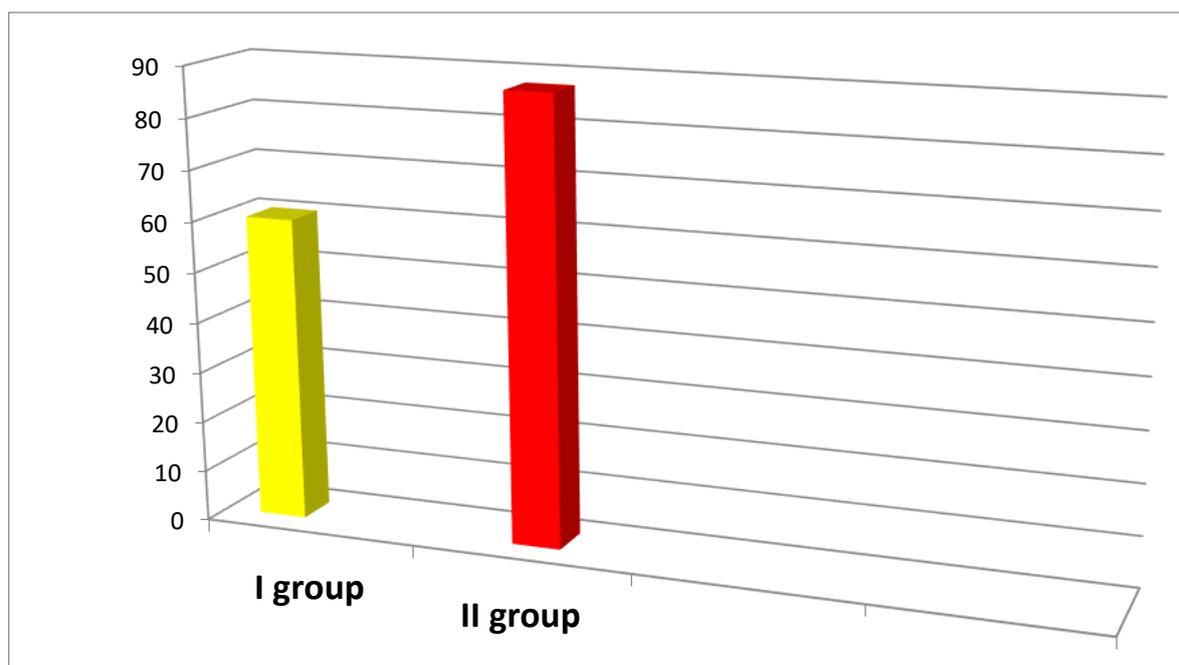


Fig. 2. Graphic representation of the prevalence of periodontitis

The analysis of the structure of periodontal diseases showed that in the examined group I the most common periodontal lesion was periodontitis, which was detected in 119 ($79.69 \pm 6.7\%$) examined. 38 ($19.29 - 1.7\%$) young people were diagnosed with chronic gingivitis, 21 ($10.66 - 1.3\%$) – periodontosis (clinical gingival health on a reduced periodontium). Clinically healthy periodontal tissues were found only in 19 ($9.64 \pm 0.9\%$) surveyed residents with insufficient living conditions. Approximately the same structure of periodontal diseases was found in the examined group II: periodontitis was found in 134 subjects - $94.77 \pm 7.6\%$, chronic gingivitis - in 11 subjects

($7.19 \pm 0.9\%$), periodontosis (clinical gingival health on a reduced periodontium) - in 7 subjects ($4.58 \pm 0.3\%$) and clinically healthy periodontal tissues were found in only 1 subject - $0.51 \pm 0.04\%$. It can be stated that despite the approximate equality of the prevalence of periodontal disease, the subjects of this group had a statistically significant ($p < 0.05$) higher level of periodontitis and a lower level of inflammatory periodontal disease (gingivitis).

The analysis of the levels of reactive anxiety in the subjects depending on the presence and type of periodontal lesions showed a certain relationship between the level of reactive anxiety and the presence of a certain periodontal disease. In particular, in those examined with the presence of chronic gingivitis, the level of reactive anxiety was quite moderate (Table 2).

Table 2
Reactive anxiety in patients with gingivitis

Group	Quantity	%	Rreactive anxiety	p
I group	38	$19,29 \pm 1,7$	$46,17 \pm 3,47$	
II group	11	$7,19 \pm 0,9$	$55,64 \pm 3,61$	$<0,05$

Notes: p - compared with the first group

In contrast to patients with gingivitis, patients with periodontitis had significantly higher values of reactive anxiety (Table 3). Despite a slightly increased level of reactive anxiety in the subjects of group II, there were no significant ($p > 0.05$) differences between the levels of reactive anxiety in the subjects of both groups.

Table 3
Reactive anxiety in patients with periodontitis

Group	Quantity	%	Rreactive anxiety	p
I group	119	$60,41 \pm 6,5$	$52,17 \pm 3,89$	
II group	134	$87,58 \pm 6,9$	$55,33 \pm 3,25$	$>0,05$

Notes: p - compared with the first group

Graphically, this is presented in Fig. 3.

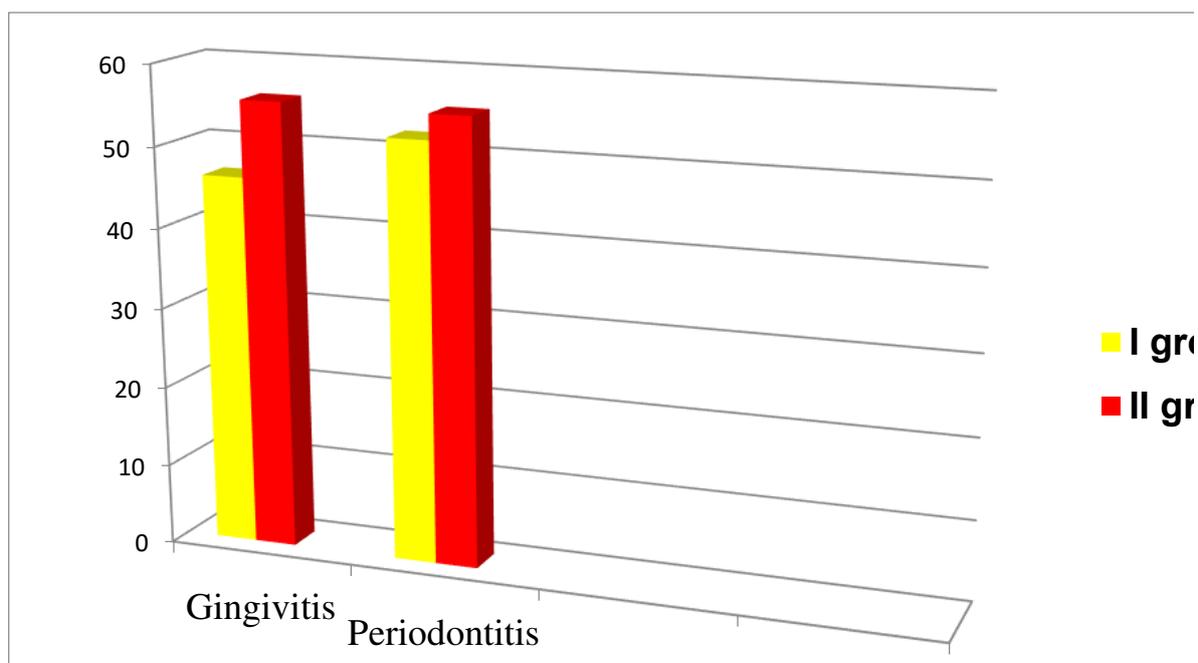


Fig. 3. Graphic representation of the level of reactive anxiety in periodontal disease

Slightly greater differences between subjects of different groups with periodontal disease were observed between levels of personal anxiety. Patients with gingivitis showed an increased level of personal anxiety, significantly higher in those examined in group II (Table 4).

Table 4
Personal anxiety in patients with gingivitis

Group	Quantity	%	Personal anxiety	p
I group	38	19,29±1,7	59,45±4,07	
II group	11	7,19±0,9	49,37±3,45	<0,05

Notes: p - compared with the first group

Similar regularity were observed in both groups of patients with periodontitis. In the subjects of group I, personal anxiety was significantly increased and significantly ($p < 0.05$) differed from the level of personal anxiety of the subjects of group II (Table 5).

Table 5
Personal anxiety in patients with periodontitis

Group	Quantity	%	Personal anxiety	p
I group	119	60,41±6,5	51,33±3,96	
II group	134	87,58±6,9	66,23±5,12	<0,05

Notes: p - compared with the first group

Graphically, this is presented in Fig. 4.

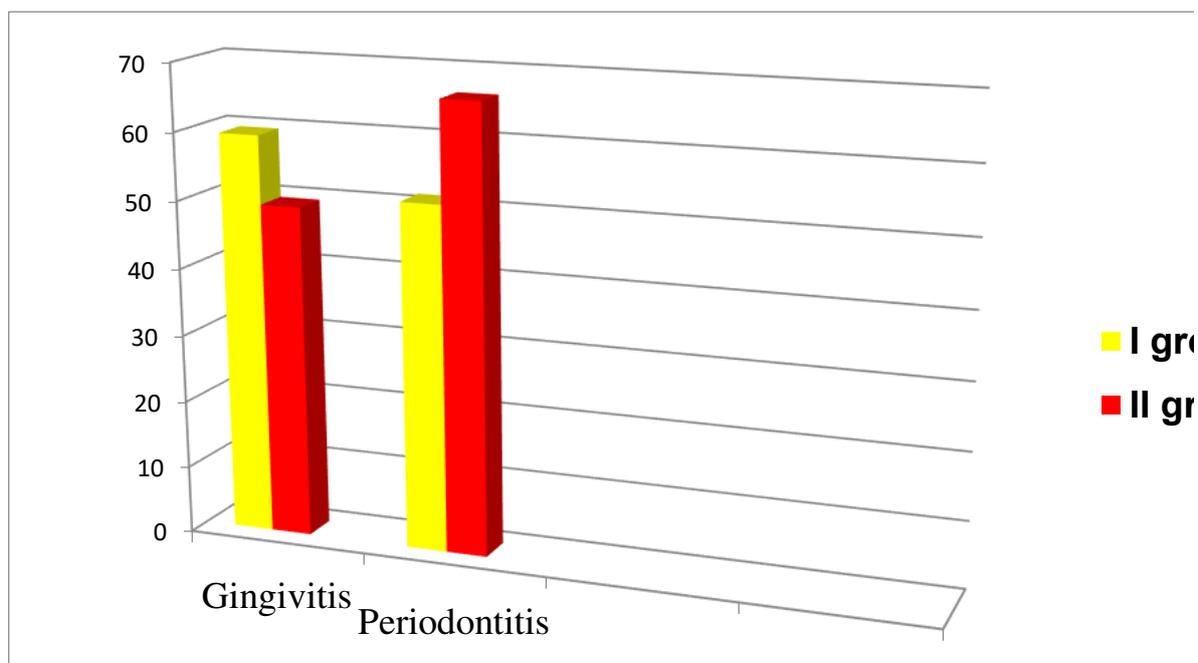


Fig. 4. Graphic representation of the level of personal anxiety in periodontal disease

Discussion

Thus, stress can cause the disease indirectly and directly Behavioral illnesses can become maladaptations, such as excessive anxiety about adverse effects, depression, anxiety, and interruption of normal behavior [14]. The amount of stress is a measure of the peak levels of stress hormones. Thus, the combination of intensity and duration constitute the magnitude of the anxiety [15].

Periodontal diseases are the multifactorial diseases promoting the identification of risk factors are gaining importance for treatment and prevention. It's suggested that stress, depression and ineffective coping may contribute to development of periodontal diseases [16]. Chronic stress may tend to have a negative effect on immunological response of body, which represents an important example of mind-body interaction that leading to an imbalance between host and microflora and further resulting in periodontal breakdown [17, 18].

The study of the prevalence and structure of periodontal disease in the subjects was carried out taking into account the presence or absence of systemic diseases of a particular origin (according to the questionnaire). A higher level of systemic diseases was found in residents with insufficient living conditions. It also affected the higher level of personal anxiety of residents. High levels of personal anxiety affect the prevalence and structure of periodontal disease. In the case of a better psychosomatic condition of the inhabitants, the incidence of periodontitis was lower. Thus, the study of the impact of psychoemotional stress on the course of periodontal disease and further development of appropriate schemes of rational treatment of periodontal disease (periodontitis) in people with psychoemotional stress is a promising urgent task of dentistry (periodontology).

Conclusions.

The Questionnaire conducted showed that unsatisfactory from the point of view of the respondents living conditions and the presence of systemic diseases significantly increase the level of personal

anxiety of the respondents. The epidemiological survey showed that in general the prevalence of periodontal disease in those surveyed with unsatisfactory living conditions is significantly higher than in those surveyed with satisfactory living conditions. The analysis of the structure of periodontal diseases showed that in those examined with unsatisfactory from their point of view living conditions, the most common periodontal lesion was periodontitis. Analysis of the levels of reactive anxiety in the subjects depending on the presence and type of periodontal diseases showed that the subjects with the presence of chronic gingivitis, the level of reactive anxiety was quite moderate. A slightly higher level of reactive anxiety was found in patients with periodontitis. The level of personal anxiety is higher if the subjects have periodontitis.

Conflict of interest

The authors declare no potential conflict of interest with respect to the research, authorships, and/or publication of this article.

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