

ORIGINAL ARTICLE

RELATIONSHIP BETWEEN THE DYSTROPHIC MANIFESTATIONS IN THE PERIODONTIUM AND INTESTINAL DYSBACTERIOSIS

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ABSTRACT

The aim: of our work was investigation of dystrophy in periodontal tissues and an attempt to establish the correlation between dystrophy in the periodontium and presence of intestinal disbacteriosis.

Materials and methods: Clinical-radiological examination was carried out in 146 patients with generalized periodontal pathology at the age from 26 to 59 years old. Among them in 92 persons generalized periodontitis was diagnosed and in 54 - periodontosis. The first stage of heaviness of the pathological process in the periodontium was revealed in 50 patients with generalized periodontitis and 28 persons with periodontosis. Other patients suffered from heavier forms of periodontal pathology (II and III stages), 42 persons with generalized periodontitis and 28 persons with periodontosis accordingly. Bacteriological analysis of feces for disbacteriosis was carried out in all patients.

Results: Changes in the physiological contour of the gums (that is macro relief of marginal periodontium) were found in the majority of examined patients. Because of the development of pathological gingival contour and recession of the gums, 72,5% of examined patients suffered from root denudation and different pathological conditions of roots cement structure - pigmentation, demineralization, wedge-shaped defects, caries. According to our clinical investigations it was found out that in majority of patients (83%) both inflammatory and dystrophic changes were present, only 17% of patients had purely atrophic process in the periodontium without inflammation. In patients with GP and periodontosis, in whom dystrophic changes were accompanied by inflammation, clinical appearance was more expressed with redness, bleeding and suppuration from the pockets, thus hiding dystrophic signs.

Conclusions: According to clinical and radiological findings numerous dystrophic changes were found in all structures of the periodontium and teeth of patients with periodontosis and generalized periodontitis. Changes intensify in disease progressing into the II-III stages. In patients with periodontosis clinical-radiological peculiarities of dystrophy were revealed in early stages of disease progression, while in generalized periodontitis dystrophic changes become apparent in late stages of disease. The presence of colon disbacteriosis was established in patients with periodontosis and generalized periodontitis. Disbacteriosis intensifies when diseases progress into II-III stages of heaviness. These data indicates to possible correlation between the development of dystrophic changes in periodontal tissues and the presence of intestinal disbacteriosis.

KEY WORDS: intestinal disbacteriosis, generalized periodontitis, periodontosis, dystrophy, gingival contour

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INTRODUCTION

Dystrophy of the periodontium is presented in clinical manifestation of two main diseases - generalized periodontitis and periodontosis. Clinical symptoms of these diseases differ in the expression of dystrophic changes in periodontal tissues, their peculiarities and extend.

Three dental terms, namely "gingivitis", "periodontitis", and "periodontosis" predominate in the world practice for the last decades. They are also approved for the general use in the medical practice and studies. The Ukrainian dentists use the terms "gingivitis" and "periodontitis" to indicate the inflammatory process (in the gums and in periodontium, accordingly), while the term "periodontosis" is applied for the dystrophic process. Though, these definitions may, to some extent,

suit the dentists, they do not fully reflect the entire complexity of the periodontal pathology, that is why the appearance of a large number of new terms in literature is quite logical. In modern literature, and especially in the English one, all the generalized processes in the periodontium, both of inflammatory and dystrophic character are more frequently united under one definition - "periodontitis".

Periodontosis is considered to be a generalized dystrophic process in periodontal tissues. Periodontosis (dystrophy of the periodontium) is a damage of periodontium, in the basis of its development lies the disturbances of tissue (cellular) metabolism, which leads to the structural changes and functions of various manifestations; in the level (stage) of the pronounced

damage of periodontium the chronic periodontitis occurs in the form of the gingival atrophy, resorption of the alveolar bone and the pathologic mobility of teeth.

Etiology of periodontitis, associated with neurotrophic changes (Danilevskyj's, theory) and changes in blood vessels of periodontium leading to reduced vascularization and thus to dystrophic changes in the tissues (Evdokimov's, theory) are well known.

It is known that the metabolism and structural organization of tissues (cells) provides the mechanisms, the total number of which is united under the definition "trophicity" [(Gr.trophikos) or pertaining to nutrition]. There are cellular and extracellular mechanisms of trophicity. The cellular mechanisms are provided with the structural organization of the cells & their autoregulation. It means that the cellular trophicity to an even greater degree is the property of the cell itself as the complex system that is selfregulated.

The extracellular mechanisms of trophicity are represented by the transport systems (blood, lymphatic and microcirculatory) and the integrative (endocrine, neurohumoral) mechanisms of regulation.

It has been determined that the disturbances of one of any other mechanisms of the trophicity (cellular or extracellular) create a higher risk for the developing of organ dystrophy, including the periodontium (periodontitis). If these disturbances are not caused by the intensification of coagulation process, than the developed dystrophies belong to the non-causative dystrophies (periodontoses).

In the cellular mechanism disturbances of trophicity, the main chain of the dystrophic pathogenesis is the fermentative process disturbances in the cell. The disturbances of autoregulation with the appearance of the enzymopathy and the development of dystrophy may be caused by various factors: hyperfunction, toxic substances, radiation, hereditary insufficiency or the absence of the enzyme and others.

Dystrophic changes of the periodontium can be formed as the result of the functional disturbances in the transport systems (blood circulation, microcirculation, ultracirculation), which provide the metabolism and the preservation of the cellular structure (cells) [1, 2]. The main chain of its pathogenesis is the hypoxia (dyscirculatory hypoxia). They can develop in cases of disturbances of the endocrine regulation of the trophicity (diabetes, thyrotoxicosis, hyperparathyroidism, etc.) or as the result of the disturbances of the nervous regulation of the trophicity of the periodontium (the disturbances of the innervation, the tumour of the brain and others).

One more mechanism of the development of dystrophy in the organism, which often is not taken into ac-

count, is intestinal dysbacteriosis (ID). But investigations of intestinal disbacteriosis as the pathogenetic factor in the development of periodontal dystrophy were not carried out by now.

THE AIM

The aim of our work was investigation of dystrophy in periodontal tissues and an attempt to establish the correlation between dystrophy in the periodontium and presence of intestinal disbacteriosis.

MATERIALS AND METHODS

Clinical-radiological examination was carried out in 146 patients with generalized periodontal pathology at the age from 26 to 59 years old. Among them in 92 persons generalized periodontitis was diagnosed and in 54 - periodontosis. The first stage of heaviness of the pathological process in the periodontium was revealed in 50 patients with generalized periodontitis and 28 persons with periodontosis. Other patients suffered from heavier forms of periodontal pathology (II and III stages), 42 persons with generalized periodontitis and 28 persons with periodontosis accordingly.

Bacteriological analysis of feces for disbacteriosis was carried out in all patients. ID was characterized by the high titers of conditional pathogenic microorganisms (CPM) and their associations with the background of normal intestinal microbiota changes. The light stage of heaviness of ID (I-II) was diagnosed in case of lowering of the quantity of Bifido- and Lacto- bacteria, Escherichia Coli in the feces and presence of Escherichia species with reduced enzyme properties. ID of I-II degree was not often revealed in patients with GP.

It is known that intestinal disbacteriosis is a clinical sign of secondary immunodeficiency syndrome. In that case, profound immunological investigation in the dynamics of ID correction is necessary to reveal the role of intestinal disbacteriosis in general disbalance of immune system and importance of immunomodulatory therapy.

The level of ID was estimated according to G. Kuzniecova [3], taking into consideration species and populations of feces microbiota. To simplify the results of investigations and make them more objective, patients with GP who had only changes of obligative microbiota were united in the ID group of I-II stages of heaviness, patients who, except changes of colon microbiocenosis, had been diagnosed the growth of quantity of conditional-pathogenic microorganisms (CPM) and their associations were taken to ID group of III-IV stages of heaviness.

Table I. The frequency of pathological gingival contour and teeth root denudation in examined patients

		arcade type		like type			
Periodontosis I stage	28	57,1	14,3	32,1	3,6	7,1	100,0
Periodontosis II-III stages	26	69,2	11,5	34,7	7,6	15,4	100,0
Generalized Periodontitis I stage	50	66,0	12,0	16,0	20,0	18,0	22,0
Generalized Periodontitis II-III stages	42	85,7	21,4	16,7	11,9	35,7	73,8

Table II. State of microbiocenosis in the colon of patients with Generalized Periodontitis (GP) and Periodontosis.

Groups of patients with periodontal dystrophy	Number of patients	Patients with periodontal dystrophy, with revealed					
		Eubiosis		Intestinal disbacteriosis of I-II degree		Intestinal disbacteriosis of III-IV degree	
		absolute number	%	absolute number	%	absolute number	%
Generalized Periodontitis I stage	50	14	28	30	60	6	12
Generalized Periodontitis II-III stages	42	–	–	18	42,9	24	57,1
Periodontosis I stage	28	5	17,9	19	67,8	4	14,3
Periodontosis II-III stages	26	–	–	14	53,8	12	46,2

RESULTS AND DISCUSSION

Changes in the physiological contour of the gums (that is macro relief of marginal periodontium) were found in the majority of examined patients. According to the data presented in the table I, in patients with periodontosis at type of gingival relief prevailed in I stage as well as in II-III stages of disease, two-three times rarely strenuously arcade type of gingival contour was observed. In patients with I stage of periodontitis all three types of pathological gingival contour (gingivoglyphics) were observed with the same frequency: flat, balloon-like, and combined, while in II-III stages of generalized periodontitis combined and strenuously arcade type of gingival contour dominated. Because of the development of pathological gingival contour and recession of the gums, 72,5% of examined patients suffered from root denudation and different pathological conditions of roots cement structure - pigmentation, demineralization, wedge-shaped defects, caries. According to our clinical investigations it was found out that in majority of patients (83%) both inflammatory and dystrophic changes were present, only 17% of pa-

tients had purely atrophic process in the periodontium without inflammation. In patients with GP and periodontosis, in whom dystrophic changes were accompanied by inflammation, clinical appearance was more expressed with redness, bleeding and suppuration from the pockets, thus hiding dystrophic signs.

Periodontal dystrophy was observed in number of signs: recession of the gums (lowering of the level of marginal gingival), atrophy of interdental papilla with formation of pathological spaces between adjacent teeth, thinning, mattering paleness of the gums (Fig.1, 2). Patients complained on gums tightening, itching, increase sensibility to thermal, mechanical and chemical irritants. Because of large interdental spaces, lot of plaque and calculus accumulated on teeth surfaces. We observed Stilman's clefts from 1-2 to 5-6mm long. In the bone of alveolar process pronounced dystrophic changes were found, which were probably caused by changes in blood and nervous supply. Radiographic examination of the bone of alveolar process showed horizontal bone loss and osteosclerosis but in deep parts of the bone osteoporosis and osteosclerosis alter-

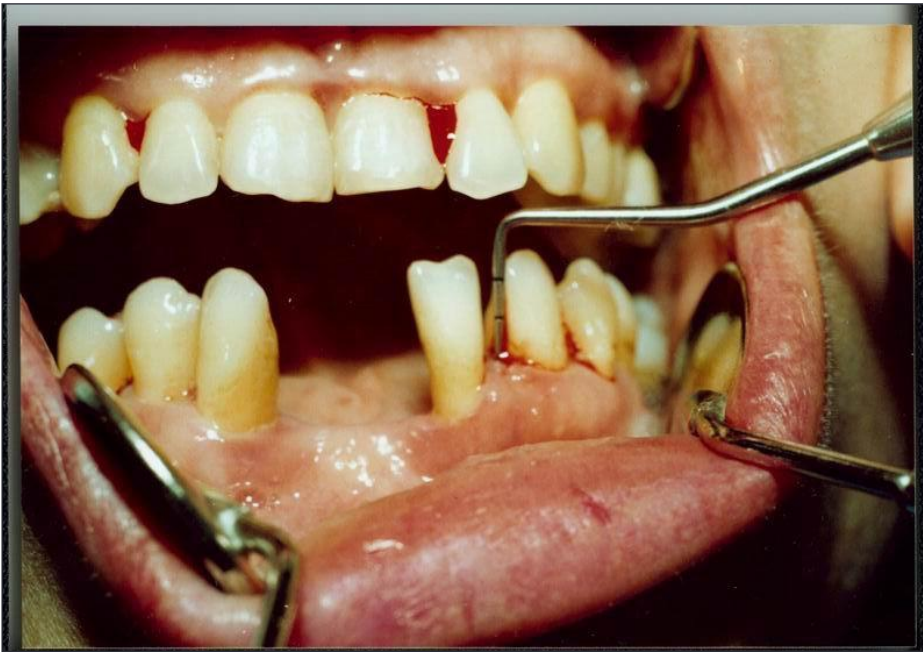


Fig.1. Slowly progressing periodontitis, IInd-IIIrd stage of heaviness with changes of gingival contour and gums recession in patient S., 45-year-old female. Note the traumatic occlusion.

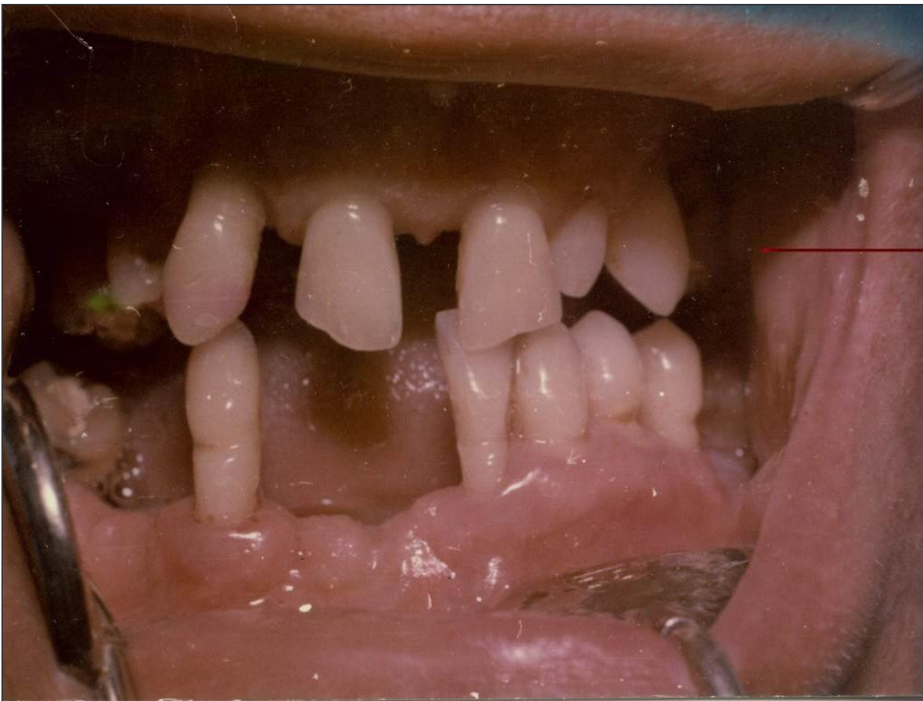


Fig. 2. Dystrophic changes in patient K., 37-year-old male. Note the prominent gingival recession.

nated with each other. Cortical plate of alveolar bone was preserved, in some places we observed its thickening. Narrowing of periodontal spaces and sometimes their complete absence (what testified to the presence of hypercementosis) were revealed. Abovementioned changes were present already in early stage of periodontosis, being more pronounced in II and III stages of the disease.

In patients with periodontosis with developed inflammation, radiographic examination besides dystrophic changes of alveolar process showed thinning and destruction of cortical plate of alveolar crests and foci

of osteoporosis.

In patients with generalized periodontitis with presence of dystrophic component X-ray showed only single zones of osteosclerosis in different parts of interdental septa, which interchange with osteoporosis, prevailing in bone structure. These manifestations of dystrophy was observed in 62,5% of patients only. It is important that number of interdental septa with vertical bone destruction in patients with periodontitis with clinical signs of dystrophy was less than in patients without dystrophic component. Thus, it is difficult to differentiate in X-ray patients with periodontosis, having

inflammatory process and periodontitis patients with dystrophic component. This fact demands detail and precise radiographic estimations.

According to bacteriological investigations of feces of examined patients changes of intestinal microbiota have been detected in the majority of them. As it is shown in table II, in persons with I stage of GP normal condition of colon microbiocenosis was detected only in 28% of patients, in most patients ID of the I-II stages prevailed. It is characterized by lowering of the quantity of Bifido- and Lacto- bacteria, Escherichia Coli in the feces and presence of Escherichia species with reduced enzyme properties. Patients with I stage of periodontosis have similar changes of colon microbiocenosis, but number of patients with eubiosis (normal condition of colon microbiota) was 1,5 times lower when compared with periodontitis patients. In II-III stages of periodontosis as well as in II-III stages of periodontitis we didn't find patients with normal colon microbiocenosis. ID of III-IV stages were diagnosed 3-5 times more often in these patients, characterized by the high titers of conditional pathogenic microorganisms (CPM) and their associations with the background of normal intestinal microbiota changes. More pronounced these changes were in periodontitis patients of II-III degree of heaviness. Probably it is due to re-infection while swallowing contents of periodontal pockets. Hence, investigations of colon microbiocenosis in patients with periodontosis and generalized periodontitis revealed that development of both of these dystrophic-inflammatory diseases proceed against a background of existing and aggravation of colon disbacteriosis.

Some researchers pay attention to the importance of dysbacteriosis in the oral cavity for the development and treatment of periodontitis [4-6]. Number of investi-

gations [7 - 11] point out that presence of intestinal disbacteriosis (ID) leads to serious changes in the absorption of important nutrients in human organism (amino acids, vitamins, microelements, et al.), has negative influence on local and general immunity, many types of metabolic processes, change of the homeostasis. That is why lingering state of intestinal disbacteriosis (ID) should have an effect on the nutrition of periodontal tissues.

CONCLUSIONS

1. According to clinical and radiological findings numerous dystrophic changes were found in all structures of the periodontium and teeth of patients with periodontosis and generalized periodontitis. Changes intensify in disease progressing into the II-III stages.
2. Characteristic signs of pathological gingival contour (gingivoglyphics) as well as other clinical- radiological peculiarities of dystrophy are different in patients with periodontosis and periodontitis and help to improve their differential diagnosis.
3. In patients with periodontosis clinical- radiological peculiarities of dystrophy were revealed in early stages of disease progression, while in generalized periodontitis dystrophic changes become apparent in late stages of disease.
4. The presence of colon disbacteriosis was established in patients with periodontosis and generalized periodontitis. Disbacteriosis intensifies when diseases progress into II-III stages of heaviness. These data indicates to possible correlation between the development of dystrophic changes in periodontal tissues and the presence of intestinal disbacteriosis.

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