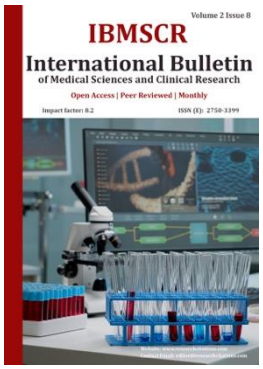

HYPOXIA OF PERIODONTAL TISSUES IN CHRONIC PERIODONTITIS

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Abstract. Chronic periodontitis (CP) is the most common periodontal pathology, which leads to dysfunction of the dental system. 52 patients with CP were examined. Each person assessed the condition of their periodontal tissues using the following indices: PMA, API, SBI. To study hypoxia, the functional activity of erythrocytes was examined using spectroscopy. It was found that changes in periodontal tissues in chronic periodontal disease are accompanied by the development of hypoxia, which requires suppression and correction of the functional activity of erythrocytes.

Key words: chronic inflammatory common periodontal diseases, periodontitis.

Аннотация. Хронический пародонтит (ХП) — наиболее распространенная патология пародонта, приводящая к нарушению функции зубочелюстной системы. Обследовано 52 пациента с ДЦП. Каждый человек оценивал состояние тканей пародонта по следующим индексам: PMA, API, SBI. Для изучения гипоксии функциональную активность эритроцитов исследовали с помощью спектроскопии. Установлено, что при хроническом пародонтите изменения в тканях пародонта сопровождаются развитием гипоксии, что требует подавления и коррекции функциональной активности эритроцитов.

Ключевые слова: хронические воспалительные распространенные заболевания пародонта, пародонтит.

Izoh. Surunkali periodontit (CP) eng keng tarqalgan periodontal patologiya bo'lib, bu tish tizimining disfunktsiyasiga olib keladi. CP bilan og'rigan 52 bemor tekshirildi. Har bir inson o'zining periodontal to'qimalarining holatini quyidagi indekslar yordamida baholadi: PMA, API, SBI. Gipoksiyani o'rganish uchun eritrotsitlarning funktsional faolligi spektroskopiya yordamida tekshirildi. Surunkali periodontal kasallik bilan periodontal to'qimalarning o'zgarishi eritrotsitlarning funktsional faolligini bostirish va tuzatishni talab qiladigan gipoksiya rivojlanishi bilan birga kelishi aniqlandi.

Kalit so'zlar: surunkali yallig'lanishli umumiy periodontal kasalliklar, periodontit.

Introduction. Inflammatory diseases of periodontal tissues, which include chronic generalized periodontitis, are widespread in the practice of a dentist and are not only a medical but also a social problem. This is due to the fact that periodontitis leads to tooth loss, and foci of infection in periodontal pockets negatively affect the body as a whole. Considering the prerequisites for the development of periodontitis, it is important to note that the cause of the pathological process in periodontal tissues can be various factors of both exogenous and endogenous origin. In this case, the effect of pathogenic factors is manifested in the case of suppression of the protective and adaptive capabilities of periodontal tissues with a decrease in the general reactivity of the body. Chronic periodontitis (CP) is the most severe and common pathology of the periodontium, which leads to significant disruption of the functions

of the dental system, death of the retaining apparatus of the teeth and loss of the latter [1].

The prevalence of CP has increased by 25.5% in the last decade among people aged 18 to 38 years, and by 68.0% among people aged 65 years and older [5]. At the same time, the proportion of patients with severe CP has increased in young people to 12.3%, and in people aged 65 years and older to 30% [5, 6].

In Uzbekistan, the prevalence of periodontal diseases currently reaches 85-90% [3].

Modern literature data indicate that CP is a polyetiological disease [4, 5]. In addition to bacterial flora (Porphyromonas gingivalis; Treponema denticola, etc.), CP can be caused by various diseases: atherosclerosis, metabolic syndrome, diabetes mellitus, osteoporosis [2, 3, 4, 5].

Therefore, when treating CP, it is necessary to take into account not only the infectious factor, but also the correction of intercurrent diseases. Thus, according to Slots J. (2017), successful treatment of CP is observed in less complex (localized) periodontitis than in generalized forms [6].

Purpose of the study: to identify a correlation between the level of periodontal tissue hypoxia and the severity of chronic periodontitis.

Materials and methods of the study: 52 patients with CP were observed, who were divided into 2 equal groups (according to the type of drug therapy). All patients underwent standard clinical and laboratory examination. All patients underwent an assessment of the periodontal tissue condition using clinical indices of PMA (papillary-marginal-alveolar index), API (approximal tooth surface hygiene index), SBI (gingival sulcus bleeding index). In order to detect hypoxia, we determined the structural and functional state of erythrocytes. RAMAN spectroscopy was used to study the functional activity of erythrocytes.

Patients of the first group (n=25) – the control group, were prescribed traditional anti-inflammatory therapy for CP: after professional hygiene (removal of dental plaque), a suspension of chlorhexidine with metrogyl was placed in the pathological periodontal pockets, oral baths with dioxidine were performed, and medicinal dressings with anti-inflammatory ointments (butadion, metrogyl denta) were applied. General anti-inflammatory treatment was prescribed in the form of antimicrobial drugs (flagyl, kliostom, metrogyl), non-steroidal anti-inflammatory drugs (indomethacin), desensitizing drugs (diazolin), vitamin therapy (A, C, P). Then, according to indications, curettage and selective grinding of teeth were performed. In the second group (n=25) – the main one, in addition to the generally accepted therapy, patients additionally received Mexicor daily for 14 days, 1 capsule (100 mg) 3 times a day. Mexicor (ethylmethylhydroxypyridine succinate) is an antioxidant drug that improves the condition of ischemic tissue due to its ability to inhibit free radical processes (the pronounced intensification of which is observed in inflammatory reactions) and reduce the damaging effect of free radicals on the cells of the connective tissue of the periodontium.

Statistical processing of the material was performed using EXCEL spreadsheets and STATISTICA 6.0 software. Differences were considered significant at $p < 0.05$ (95% significance level). The relationship between the studied quantitative indicators was assessed based on the results of correlation analysis with calculation of the Spearman correlation coefficient (R), Pearson and subsequent establishment of its significance using the t criterion. In addition, the following correlation index was used: less than 0.3 was considered insignificant; if the coefficient was equal to 0.1–0.3, the correlation was considered weak, from 0.3 to 0.6 — average, from 0.6 and above — strong.

Results. All patients presented complaints: pain when eating, hyperemia and bleeding gums, bad breath. Radiography of all patients revealed destruction of bone tissue of the interdental septa up to 1/2, foci of osteoporosis, widening of the periodontal space in the cervical area. In patients of both groups, the initial (before treatment) oral hygiene condition was assessed as unsatisfactory according to the API, PMA and SBI indices.

However, we did not find statistically significant differences in these between the two groups ($p > 0.05$), therefore, the first and second groups are comparable. In patients of both groups, before the start of treatment, the study of the functional activity of erythrocytes in severe CP revealed significant violations: an increase in the nonspecific permeability of erythrocytes by 22.8%, the index of erythrocyte deformability was below the norm by 36.8%. Traditional therapy for severe CP made it possible to achieve some improvement in the condition of periodontal tissues, but did not lead to a stable state of remission. In patients of the control group, the functional activity of erythrocytes did not change significantly against the background of traditional therapy.

In patients of the 2nd group, after anti-inflammatory and antioxidant therapy, an increase in the activity of red blood cells by 23.8% was recorded compared to the first group of patients. Thus, the degree of damage to red blood cells in CP is associated with the severity of the pathology.

Consequently, the use of antioxidant therapy with Mexicor in the treatment of CP leads to a decrease in hypoxia in periodontal tissues, a decrease in the permeability and fragility of capillaries and bleeding gums, which was a reliable criterion for the possibility of using this drug to improve the effectiveness of treatment of the studied periodontal pathology

Conclusions. In CP, changes in periodontal tissues are accompanied by inhibition of the functional activity of red blood cells, the development of hypoxia, which requires correction. The use of antioxidants helps to improve the microcirculation of periodontal tissues, forms tolerance of periodontal tissues to damaging agents, which prevents the development of hypoxia and leads to a decrease in the recurrence of the disease.

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