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Research Article

The effect of complex treatment on some hematological and hemostasiological indicators during the treatment of generalized periodontitis in patients with different blood group affiliation

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Abstract

The article presents the results of treatment of 157 patients with generalized periodontitis depending on blood type. In the blood of patients with generalized periodontitis was determined: the number of erythrocytes, the number of leukocytes, platelets, neutrophils, leukocyte intoxication index, fibrinogen. After treatment, analysis of blood cell composition showed that 1 year after treatment of generalized periodontitis, carriers of 0 (I) and A (II) blood type increased the number of erythrocytes in the blood – 1.2 times. At the same time, a decrease in the number of leukocytes on average was determined by 1.4 times, and leukocyte intoxication index values – by 2.0 times in representatives of 0 (I) and B (III) blood type; neutrophils – 1.4 times in people with A (II) blood type; platelets – 1.3 times in carriers with 0 (I) and AB (IV) blood type, according to data before treatment. The improvement of hematological and hemostasiological indicators of blood in patients with generalized periodontitis indicates a positive effect on the organs and systems the medicines we have prescribed, the positive effect of which is reflected, in particular, on the complex of tooth-retaining tissues.

Keywords

generalized periodontitis, erythrocytes, leukocytes, blood type

Introduction

Treatment and rehabilitation of patients with inflammatory diseases of periodontal tissues is one of the most difficult problems in modern dentistry, which is reflected in the huge number of proposed tools and methods, which are not always effective. Currently, dentists have come to understand that in the treatment of inflammatory diseases of periodontal tissues it is necessary to use methods aimed at restoring local tissue homeostasis and the entire pathogenetic mechanism of this pathology (Al-Askar et al. 2019). Along with the use of modern methods of therapeutic treatment of affected systems, it is necessary to use methods of integrated polysystemic correction at

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the cell-molecular level. This is due to the fact that any chronic disease is the final stage of a long pathophysiological process in the body, when the mechanisms of cellular alteration are initiated and mediated by redox reactions, impaired transport-trophic functions and cytokine regulation with the development of immune-pathological processes (Cekici et al. 2014).

Blood is the main component of the liquid internal environment of the body, its cellular and molecular composition performs many functions. The heterogeneous cellular composition of blood in people of different sexes and ages is well known, which is usually associated with a pronounced effect on hematopoiesis of immunocompetent cells of hormones produced by the gonads (Demkovych et al. 2021a). The analysis of heterogeneity associated with the presence of AB0 antigens and their biological implementation is not sufficiently covered (Miralda and Uriarte 2021).

The AB0 system itself is a system of balanced polymorphism, which is one of the tools that increase the adaptive capacity of the population, ensuring their resistance to adverse environmental influences, as well as diseases (Zabolotny et al. 2016). To explain the associations between blood groups and human diseases, the theory of pleiotropic genes is proposed, as well as data on the similarity of the pathogen with human blood factors (Cintra et al. 2014).

Thus, it was studied that the first blood type is favorable for the development of peptic ulcer of the stomach and duodenum, gastritis, severe gastrointestinal diseases, hip dysplasia (Bandrivskaia et al. 2014). People with the second blood type suffer from obliterating atherosclerosis (endarteritis) of the lower extremities, rheumatic diseases, bronchial asthma, allergies, leukemia, cholecystitis, gallstones (Dankevych-Kharchyshyn et al. 2019). The owners of the third blood type, in greater numbers, have pneumonia, radiculitis, joint disease (Li et al. 2021). The fourth blood type is more characterized by diseases such as SARS, sore throat, sinusitis, diseases of the cardiovascular system (Hasiuk et al. 2021).

According to the analysis of literature sources (Demkovych et al. 2022), patients with many infectious and non-infectious diseases are dominated by persons with blood group A (II) antigens and, less frequently, blood group B (III) antigens.

Some researchers (Li et al. 2018) believe, that genetic factors are important in the development of fluorosis. Markers of predisposition to fluorosis are phenotypes 0 of the AB0 system. The development of atherosclerosis or osteoporosis under the action of fluorides is largely determined genetically, a marker of osteosclerosis is the phenotype B (AB0).

In the literature available to us, we did not find data on the relationship between blood type and susceptibility to periodontal disease, did not study group-specific metabolic features as a platform for the pathogenesis of generalized periodontitis. Therefore, the establishment of associated links between metabolic, cytometric characteristics and antigens AB0 will help identify groups at increased risk of inflammatory and dystrophic – inflammatory diseases of periodontal tissues, to clarify their polymorphism, to identify groups with disease and a combination of different forms pathology.

Objective. To evaluate the effectiveness of the treatment patients with generalized periodontitis with different blood group affiliation drugs offered by us.

Materials and methods

Treatment of patients with generalized periodontitis was performed in 157 patients (main group): with 0 (I) blood type – 48 patients; with A (II) blood type – 43 patients; with B (III) blood type – 35 patients and with AB (IV) blood type – 31 patients. The appointment of drugs was carried out depending on the blood type of patients and the degree of generalized periodontitis (Bandrivsky et al. 2022). Considering the data obtained in our previous studies (Bandrivsky et al. 2019), changes some hematological and hemostasiological indicators were of the same type for representatives of 0 (I) and A (II) blood type and B (III) and AB (IV) with varying severity of periodontitis. Therefore, the treatment was the same, but differed in the dose and frequency of preparations for representatives of 0 (I) and A (II) blood types and B (III) and AB (IV). The control group of patients consisted of 133 people who were treated for generalized periodontitis according to conventional methods (Plessas 2014).

Thus, patients with 0 (I) and A (II) blood type and generalized periodontitis of I degree were prescribing hydrogel "Gengigel" (RicerFarma, Italy) oral bathes (10 ml undiluted) – for 7 days; gel "Gengigel" (RicerFarma, Italy) – gingival applications for 7 days; "Imunal" (Lec, Slovenia) – 1 tablet 3 times per a day for 14 days. Whereas, patients with B (III) and AB (IV) blood type and generalized periodontitis of I degree were prescribed hydrogel "Gengigel" (RicerFarma, Italy) oral bathes (10 ml undiluted) – for 5 days; gel "Gengigel" (RicerFarma, Italy) – gingival applications for 5 days; "Imunal" (Lec, Slovenia) – 1 tablet 3 times per a day for 10 days.

Patients with generalized periodontitis of II degree with 0 (I) and A (II) blood type were prescribed "Lactoferrin Defense" rinse aid (SesDerma, Spain) – instillation into periodontal pockets for 10 days; gel "NBF Gingival Gel" (Nano Cure Tech, South Korea) – gingival applications for 10 days; "Nucleinate" (Kyivmedpreparat, Ukraine) – 1 capsule 2 times per a day with meals for 14 days. Patients with B (III) and AB (IV) blood type and generalized periodontitis of II degree were prescribed "Lactoferrin Defense" rinse aid (SesDerma, Spain) – instillation in periodontal pockets for 7 days; gel "NBF Gingival Gel" (Nano Cure Tech, South Korea) – gingival applications for 7 days; "Nucleinate" (Kyivmedpreparat, Ukraine) – 1 capsule 2 times per a day with meals for 10 days.

Patients with 0 (I) and A (II) blood type with grade III generalized periodontitis were prescribed "Biorepair Mouthwash Gum Protection" rinse aid (Biorepair, Italy) – mouth baths, instillation in periodontal pockets for 10 days; gel "Perio – AID Protect" (Dentaid, Spain) – gingival

applications for 10 days; "Nucleinate" (Kyivmedpreparat, Ukraine) – 1 capsule 2 times per a day with meals for 14 days; "Glutamic acid" (JSC "Kyiv Vitamin Plant", Ukraine) – 2 tablet 2 times per a day with meals for 14 days. Patients with B (III) and AB (IV) blood type and generalized periodontitis III degree were prescribed "Biorepair Mouthwash Gum Protection" rinse aid (Biorepair, Italy) – mouth baths, instillation into periodontal pockets for 10 days; gel "Perio – AID Protect" (Dentaid, Spain) – gingival applications for 10 days; "Nucleinate" (Kyivmedpreparat, Ukraine) – 1 capsule 2 times a day with meals for 10 days; "Glutamic acid" (JSC "Kyiv Vitamin Plant", Ukraine) – 1 tablet 2 times per a day with meals – for 10 days.

The total blood test was determined using an automatic hematology analyzer "Sysmex KX-21" from Roche (Japan) using a commercial kit of reagents from Roche (Germany), which counts the number of blood cells using conductometric detection. Differentiated calculation of the expanded leukocyte formula was performed using a Zeiss light microscope according to a unified method (Jiang et al. 2021), the principle of which is microscopy of stained blood smears with differentiation of different forms of leukocytes. The index of leukocyte intoxication (Kolte et al. 2014) was calculated by the formula I.I. Kalf-Kaifa in the modification of E.M. Siromyatnikov. Evaluation of the plasma part of the blood wrapping system was performed using an automatic analyzer STA-Compact, the company "Roche" (France), using reagents and control plasmas of two levels of the company "Roche" (France). Determination of fibrinogen was performed according to the Klaus test (Mutthineni et al. 2021). Thrombin is added to 10 times diluted with Veronal buffer citrate plasma and the time to fibrin clot formation is measured. Under such conditions, the time of clot formation is directly proportional to the concentration of fibrinogen in the plasma under study. The calculation was performed automatically; the test was recalibrated by the manufacturer.

Statistical calculation of the obtained results was performed using the application programs "Statistica 8.0" (StatSoft, USA) and the package of statistical functions of the program "Microsoft Excel 2021" (Orlov 2015).

Results

As a result of the treatment in patients with generalized periodontitis with 0 (I) blood type of the main group was determined to improve the values of certain hematological and hemostasiological parameters (Table 1). Thus, after 1 month in patients with generalized periodontitis with 0 (I) blood type studied a decrease in the number of: leukocytes in 1,5 times ($9.60\pm0.36 \times 10^9$/l vs. 6.25 ± 0.30 10^9/l, $p<0.01$, $p_1<0.05$), platelets up to $316.36\pm50.90 \times 10^9$/l against $334.48\pm49.25 \times 10^9$/l, $p<0.01$, $p_1<0.05$; values of the leukocyte intoxication index 1.3 times (1.57 ± 0.08 vs. 1.29 ± 0.05, p, $p_1<0.05$); fibrinogen content – by 36.71%, $p<0.05$, $p_1>0.05$. At the same time, investigated the probable increase in the number of erythrocytes in the blood, p, $p_1<0.05$.

Table 1. Dynamics of values of hematological and hemostasiological indicators in patients with generalized periodontitis with 0 (I) blood group, in different treatment terms.

Indicators	Before treatment	Terms of treatment		
		1 month after treatment	6 months after treatment	1 year after treatment
Erythrocyte count ($\times 10^{12}$/l)	3.94±0.06 / 3.96±0.06	4.10±0.07°°** / 3.90±0.06	4.54±0.08°* / 3.62±0.07°	4.62±0.09°* / 3.86±0.06
Leukocyte count ($\times 10^9$/l)	9.60±0.36 / 9.60±0.36	6.25±0.30°** / 7,38±0.34°	6.15±0.28°* / 8.20±0.33°°	6.42±0.30°* / 8.96±0.34
Leukocyte intoxication index	1.57±0.08 / 1.58±0.08	1.29±0.05 / 1.24±0.07	0.89±0.03°* / 1.38±0.08	0.80±0.04°°* / 1.47±0.09
Platelets ($\times 10^9$/l)	334.48±50.90 / 334.47±50.90	316.36±49.25° / 330.82±49.86°	286.89±45.52° / 300.47±47.68°	263.35±43.20° / 334.29±49.15
Fibrinogen, (g/l)	4.93±0.62 / 4.94±0.62	3.12±0.59°° / 4.28±0.60	2.68±0.57°° / 4.16±0.59	2.60±0.58°°** / 4.44±0.60

Notes:
a / b = values of indicators in patients of the main group / values of indicators in patients of the control group;
°p<0.01, °°p<0.05 – significant difference in the values of parameters in patients research groups in relation to the data before treatment;
*p_1<0.01, **p_1<0.05 – significant difference in the values of parameters in patients of the control group in relation to the data before treatment.

It should be noted that in the patients of control group with 0 (I) blood type, in which traditional treatment measures were used for the treatment of generalized periodontitis, after 1 month of follow-up, significantly decreased the number of leukocytes (1.3 times) and platelets (1.1 times), $p<0.01$, relative to reference data. The dynamics of the values of the remaining studied parameters was equal to the initial values, $p>0.05$.

After 6 months of follow-up in patients with generalized periodontitis with 0 (I) blood type, using our developed therapeutic complex of general and local action, studied the increase in the number of erythrocytes in the blood (1.4 times) background of reducing the quantitative composition leukocytes (1,6 times) and leukocyte intoxication index (1.8 times), $p<0.01$, $p_1<0.01$, in relation to treatment data. At the same time, we recorded a significant decrease in the number of platelets in the blood (1.2 times), $p<0.01$, $p_1<0.05$, and a decrease in fibrinogen by 45.64%, $p<0.05$, $p_1<0.05$, in the treated main group relative to baseline values. In patients of the control group, after 6 months of observation, as a result of using traditional treatment measures for the treatment of generalized periodontitis, investigated a significant increase in the number of erythrocytes in the blood (1.2 times), $p<0.01$, with a decrease in the number of leukocytes (1.1 times), $p<0.01$, relative to baseline values. However, the data of the remaining studied hematological and hemostasiological parameters were equal to the values before treatment, $p>0.05$.

After 12 months of observations in the patients of main group, carriers of 0 (I) blood type, in the curation of generalized periodontitis using our proposed method, the positive dynamics of the values of the analyzed hematological and hemostasiological indicators was preserved. In this case, in the patients of this group determined an increase in the quantitative composition of erythrocytes by 1.2 times with a decrease in the number of leukocytes and leukocyte index of intoxication by 1.5 times and 2.0 times, respectively, $p<0.01$, $p_1<0.01$. At the same time, in patients

with generalized periodontitis of the main group studied, a probable decrease in platelet count (1.3 times), p<0.01, and fibrinogen level – by 47.26%, p<0.05, in relation to before treatment data.

In the patients of control group, in which traditional methods were used for the treatment of generalized periodontitis in this period of the study, the values of the analyzed hematological and hemostasiological parameters were equal to the reference data, p<0.05.

Analysis of changes in hematological and hemostasiological parameters important for patients with A (II) blood type showed (Table 2) that as a result of using the treatment complex developed by us for the treatment of generalized periodontitis, 1 month after treatment the studied parameters were significantly improved.

Thus, in the patient's main group, at this time of observation increased the quantitative content of erythrocytes ($4.25\pm0.09 \times 10^{12}$ g/l vs. $3.89\pm0.08 \times 10^{12}$ g/l), $p_1<0.05$, at decrease in the number of neutrophils (56.26±2.18% vs. 65.42±2.27%), $p_1>0.05$, relative to before treatment data, p<0.05. In this case, the subjects of the main group 1 month after treatment was determined to reduce the level of fibrinogen by 32.68%, p<0.05.

In the patients of control group, at the treatment of generalized periodontitis by traditional measures, after 1 month of observations, the values of the analyzed hematological and hemostasiological parameters, although had a positive dynamic, but equal to the initial data, p>0.05.

Table 2. Dynamics of values of hematological and hemostasiological parameters in patients with generalized periodontitis with A (II) blood type, in different treatment terms.

Indicators	Before treatment	Terms of treatment		
		1 month after treatment	6 months after treatment	1 year after treatment
Erythrocyte count ($\times 10^{12}$/l)	3.89±0.08 / 3.88±0.08	4.25±0.09°°** / 4.00±0.08	4.76±0.12°* / 3.80±0.07	4.52±0.11°* / 3.74±0.06
Neutrophils (%)	65.42±2.27 / 65.43±2.27	56.26±2.18°° / 57.31±2.25°°	50.74±2.17°°** / 59.20±2.26	48.21±2.15°°* / 63.48±2.24
Fibrinogen, (g/l)	4.56±0.44 / 4.56±0.44	3.07±0.40°° / 3.82±0.44	3.20±0.42°° / 4.12±0.41	3.34±0.51°°** / 4.72±0.45

Notes:
a / b = values of indicators in patients of the main group / values of indicators in patients of the control group;
°p<0.01, °°p<0.05 – significant difference in the values of parameters in patients research groups in relation to the data before treatment;
*p_1<0.01, **p_1<0.05 – significant difference in the values of parameters in patients of the control group in relation to the data before treatment.

In 6 months after treatment in patients with generalized periodontitis of the main group there was a further positive dynamic of the analyzed blood parameters. We investigated that the number of erythrocytes in this group increased 1.2 times relative to the data before treatment ($4.76\pm0.12 \times 10^{12}$ g/l), p<0.01, $p_1<0.01$, with a decrease the percentage of neutrophils in 1,3 times (50.74±2.17%), p <0.05, $p_1<0.05$, relative to baseline values. The concentration of fibrinogen in the blood of patients of the main group was 3.20±0.42 g/l, which was 29.82% lower than the reference data, p<0.05, $p_1<0.05$.

In subjects of the control group at 6 months after treatment, the values of the studied blood parameters deteriorated and did not differ statistically significantly from baseline, p>0.05.

After 12 months of research in patients with generalized periodontitis of both groups of studies, the value of the studied blood parameters slightly deteriorated. However, in the main group, where for the treatment of generalized periodontitis used our proposed treatment regimen of general and local action, the quantitative content of erythrocytes in the blood remained 1.2 times higher, p<0.01, with a decrease in the percentage of neutrophils in blood 1.4 times, p<0.05, $p_1<0.01$, relative to reference data. The content of fibrinogen in the blood of patients of the main group was 3.34±0.51 g/l, which was less than the baseline data by 26.75%, p<0.05, $p_1<0.05$. One year after treatment in patients of the control group, in whom generalized periodontitis treatment was carried out according to standard methods, the values of the analyzed blood parameters were equal to the reference data, p>0.05.

During studying the blood parameters for patients with generalized periodontitis, carriers of B (III) blood type of the main group (Table 3) it was found, that when using our developed therapeutic complex of local and general action, after 1 month of observation, quantitative composition of leukocytes decreased in 1,1 times relative to baseline data ($8.21\pm0.25 \times 10^9$/l vs. $9.44\pm0.30 \times 10^9$/l, p<0.01, $p_1>0.05$). It was found that in the main group the leukocyte intoxication index decreased by 1.3 times relative to the data before treatment (0.74±0,05 vs. 0.98±0,07, p<0.05, $p_1>0.05$.

In the control group, in which traditional therapy was used for the treatment of generalized periodontitis, after 1 month of follow-up, was a significant decrease in the number of leukocytes relative to baseline values ($8.48\pm0.27 \times 10^9$/l vs. $9.45\pm0.30 \times 10^9$/l, p<0.05). At the same time, the values of the leukocyte intoxication index and the content of fibrinogen in the blood tended to decrease, but the obtained data did not differ statistically significantly from the baseline data, p> 0.05.

Table 3. Dynamics of values of hematological and hemostasiological parameters in patients with generalized periodontitis with B (III) blood group, in different treatment terms.

Indicators	Before treatment	Terms of treatment		
		1 month after treatment	6 months after treatment	1 year after treatment
Leukocyte count ($\times 10^9$/l)	9.44±0.30 / 9.45±0.30	8.21±0.25° / 8.48±0.27°	8.00±0.22°** / 8.86±0.28	7.70±0.19°* / 9.54±0.31
Leukocyte intoxication index	0.98±0.07 / 0.97±0.07	0.74±0.05°° / 0.80±0.06	0.59±0.04°** / 0.83±0.07	0.52±0.03°* / 0.96±0.07
Fibrinogen, (g/l)	5.00±0.63 / 5.06±0.96	4.80±0.88 / 5.00±0.90	3.76±0.55°° / 5.06±0.87	3.37±0.51°°** / 5.23±0.67

Notes:
a / b = values of indicators in patients of the main group / values of indicators in patients of the control group;
°p<0.01, °°p<0.05 – significant difference in the values of parameters in patients research groups in relation to the data before treatment;
*p_1<0.01, **p_1<0.05 – significant difference in the values of parameters in patients of the control group in relation to the data before treatment.

After 6 months of observation in patients with generalized periodontitis of the main group with B (III) blood type, investigated further positive dynamics of the studied blood parameters, which was characterized by a decrease in blood leukocytes to 8.00±0.22 × 10^9/l, values of the leukocyte intoxication index up to 0.59±0.04, $p<0.01$, $p_1<0.05$ and fibrinogen content up to 3.76±0.55 g/l, $p<0.05$, $p_1>0.05$. At the same time, in the control group at this time of the study, the values of the studied blood parameters increased slightly, but did not differ from the data before treatment, $p>0.05$.

After 1 year of research, in the patients of the main group with B (III) blood type, where for the treatment of generalized periodontitis used our proposed treatment regimen, determined the stabilization of the studied blood parameters. Thus, we found a decrease in the quantitative composition of leukocytes by 1.2 times, the leukocyte intoxication index – by 1.9 times, $p<0.01$, $p_1<0.01$, and fibrinogen content in the blood – by 32.60%, $p<0.05$, $p_1<0.05$.

The study of blood values in patients with generalized periodontitis, carriers of AB (IV) blood type showed that in the main group, where for the treatment of generalized periodontitis used our treatment regimen (Table 4), after 1 month of observation the quantity of platelet in the blood of the subjects decreased to 298.15±17.85 × 10^9/l and the concentration of fibrinogen to 3.99±0.24 g/l, $p>0.05$.

A similar trend was observed in the treated control group, however, the value of platelet counts and fibrinogen in the blood of individuals in this group did not differ statistically significantly from data before treatment, $p>0.05$.

Table 4. Dynamics of values of hemostasiological parameters in patients with generalized periodontitis with AB (IV) blood group, after therapy.

Indicators	Before treatment	Terms of treatment		
		1 month after treatment	6 months after treatment	1 year after treatment
Platelets (× 10^9/l)	326.10±18.10 / 326.10±18.10	298.15±17.85 / 319.15±18.00	270.20±17.75°° / 300.82±18.06	242.0±17.70°* / 335.20±18.65
Fibrinogen, (g/l)	4.26±0.25 / 4.27±0.25	3.99±0.24 / 4.16±0.25	3.42±0.23°° / 4.05±0.24	3.15±0.22°* / 4.46±0.27

Notes:
a / b = values of indicators in patients of the main group / values of indicators in patients of the control group;
°$p<0.01$, °°$p<0.05$ – significant difference in the values of parameters in patients research groups in relation to the data before treatment;
*$p_1<0.01$, **$p_1<0.05$ – significant difference in the values of parameters in patients of the control group in relation to the data before treatment.

After 6 months of follow-up in the main group with AB (IV) blood type, determined a significant decrease in platelet count in the blood by 1.2 times (270.20±17.75 × 10^9/l vs. 326.10±18.10 × 10^9/l, $p<0.05$) and fibrinogen concentration by 19.72%, $p<0.05$, $p_1<0.01$. In patients of the control group in this study period, the values of the analyzed blood parameters were equal to the values before treatment, $p>0.05$.

One year after treatment in patients of the main group with AB (IV) blood type values of hemostasis indicators showed positive dynamics, characterized by a decrease in platelet count by 1.3 times and fibrinogen concentration by 26.06%, $p<0.01$, $p_1<0.01$. At the same time, in patients of the control group, as in the previous terms of the study, the values of the obtained hemostasis parameters were equal to the values before treatment.

Discussion

As a result of searching for correlations between blood groups of the AB0 system and some diseases, interesting data were obtained (Gao et al. 2020). Thus, in patients with cholecystitis, especially in men, blood type A (II) is more common than in healthy individuals; among patients with cholecystitis with A (II) blood type more often than in donors, belonging to a negative rhesus.

A group of scientists found a correlation between diseases of individual neuroinfectious and blood groups, different for men and women (Drucker et al. 2020). Thus, the general tendency to increase the risk of certain infections among people with A (II) blood type and to reduce the risk in the group of people with AB (IV) blood type is shown.

There is evidence that in patients with gastric ulcer membership in group 0 (I) can be considered a risk factor (Demkovych et al. 2021b). People with blood type AB (IV) are almost twice as likely to suffer from this disease. Dependence on the sex of patients and Rh factor in blood for persons with gastric and duodenal ulcers was not detected.

There are reports in the literature on the association between blood types and the incidence of viral hepatitis (Cintra et al. 2014). Thus, when examining children aged 6 months to 20 years with different blood types, it was found that viral hepatitis is more common in people with blood types 0 (I), A (II) and severe – with blood type AB (IV).

Thus, according to the analysis of literature sources, among patients with many infectious and non-infectious diseases, individuals with blood type A (II) antigens and, less frequently, blood type B (III) antigens predominate (Hasiuk et al. 2021).

Often lesions of the oral cavity complicate the course of diseases of the hematopoietic organs (Demkovych et al. 2021c), and therefore the dentist must conduct active dental therapy in the process of general treatment of patients.

The search for alternative treatments for inflammatory periodontal tissue disease has led dentists to use antioxidants in periodontology (Chen 2017). However, in most cases, the tactics of prescribing antioxidants are empirical rather than scientifically sound. In the treatment of periodontal diseases there are still no effective and safe approaches to the use of drugs that provide prevention and treatment of pathological processes caused by free radicals (Lysokon et al. 2022).

Our proposed therapy was more effective than traditional treatment regimen, and improves the metabolic properties of oral fluid, which are responsible for the induction and development of dystrophic – inflammatory processes in periodontal tissues.

Analysis of the cellular composition of the blood showed that 1 year after treatment of generalized periodontitis, carriers of 0 (I) and A (II) blood types increased the number of erythrocytes in the blood – 1.2 times, $p<0.01$, $p_1<0.01$. At the same time, a decrease in the number of leukocytes on average was determined by 1.4 times, and leukocyte intoxication index values – by 2.0 times in representatives of 0 (I) and B (III) blood type; neutrophils – 1.4 times in people with A (II) blood type; platelets – 1.3 times in carriers with 0 (I) and AB (IV) blood type, according to data before treatment.

Normalization of prognostic – significant for a particular blood type values of structural and functional composition of blood cells in patients with generalized periodontitis prove the effectiveness of using purposed by us therapy in the treatment of generalized periodontal tissue lesions.

Conclusion

Thus, improvement of hematological and hemostasiological indicators of blood in patients with generalized periodontitis indicates a positive effect on the organs and systems the medicines we have prescribed, the positive effect of which is reflected, in particular, on the complex of tooth-retaining tissues.

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