

DOI 10.25789/YMJ.2025.89.12

UDC 616.31-08-039.71

I.D. Ushnitsky, A.A. Ivanova, O.S. Unusyan, A.V. Ivanov,
Y.A. Akhremenko, K.V. Komzin, O.P. Ivanova, P.P. Bessonov,
N.G. Bessonova

METHOD OF TREATMENT OF CHRONIC PERIODONTITIS OF MEDIUM SEVERITY WITH DYSBACTERIOSIS

Chronic periodontitis is the most widespread stomatologic disease, leading to tooth loss, disorder of occlusion, temporomandibular joint and dento-mandibular system function, etc. At the same time, chronic periodontitis is more severe clinically when the balance of microflora is disturbed, which determines the need to restore endoecological balance in the treatment of chronic periodontitis. In this regard, studies aimed at solving this problem are relevant and have scientific and practical importance in clinical periodontology. Purpose of the study. To improve the effectiveness

USHNITSKY Innokenty Dmitrievich – MD, Professor, head of the Department of Therapeutic, Surgical, Orthopedic Dentistry and Pediatric Dentistry of M.K. Ammosov Northeastern Federal University, e-mail: incadim@mail.ru, ORCID.org/ 0000-0002-4044-3004; **IVANOVA Aitalina Alekseevna** – senior lecturer at the Department of Therapeutic, Surgical, Orthopedic Dentistry and Pediatric Dentistry of M.K. Ammosov Northeastern Federal State Educational Institution, e-mail: aitalinalex@mail.ru, ORCID.org/0009-0008-7357-9902; **UNUSYAN Onik Sarkisovich** – PhD, Associate Professor of the Department of Surgical Diseases and Dentistry, M.K. Ammosov Northeastern Federal University, e-mail: onikunusyan@gmail.com, ORCID.org / 0000-0002-8839-4205; **IVANOV Andrian Vladimirovich** – PhD, Associate Professor of the Department of Surgical Diseases and Dentistry, M.K. Ammosov Northeastern Federal University, e-mail: andrian_ivanov@mail.ru, ORCID.org / 0009-0003-9352-1111; **AKHREMENKO Yana Alexandrovna** – PhD, Associate Professor of the Department of Histology and Microbiology, M.K. Ammosov Northeastern Federal University, e-mail: yanalex2007@yandex.ru, ORCID.org / 0000-0001-9530-3319; **KOMZIN Kirill Vasilevich** – senior lecturer at the Department of Histology and Microbiology of M.K. Ammosov Northeastern Federal University, e-mail: de_trout@mail.ru, ORCID.org /0000-0003-2788-0397; **IVANOVA Olga Pavlovna** – MD, Associate Professor, Leading Researcher of the Laboratory of Advanced Medical Research, Kemerovo State University, e-mail: olgaa-75@mail.ru, ORCID.org/0000-0002-1459-7747; **BESSONOV Prokopy Prokopyevich** – PhD, Associate Professor of the Department of Hospital Therapy, Occupational Diseases and Clinical Pharmacology, M.K. Ammosov Northeastern Federal University, e-mail: bessonovproc@mail.ru, ORCID – 0000-0001-6649-8452; **BESSONOVA Natalia Georgievna** – PhD, Associate Professor of the Department of Hospital Therapy, Occupational Diseases and Clinical Pharmacology, M.K. Ammosov Northeastern Federal University, e-mail: bessonovang@yandex.ru, ORCID – 0000-0001-6169-3304.

of complex treatment of chronic periodontitis with the substantiation of rational approach to the correction of dysbiotic state and to develop practical recommendations. Study material. A clinical and epidemiological study was conducted in groups with dysbiosis (n=504) and without dysbiosis (n=732) aged from 15 to 74 years. At the same time, the developed method for the treatment of chronic generalized periodontitis was used in 328 patients aged 35 to 48 years with concomitant gastrointestinal diseases and laboratory-established grade 2 dysbiosis of the large intestine. A randomized group, a blinding group and a placebo-control group were formed according to the modern concept of evidence-based medicine. In the course of complex treatment to restore oral dysbiosis, a therapeutic paste was used locally with administration into the periodontal pocket based on synbiotic "Bifikin Forte" 20 billion CFU, oil solution of vitamin "A" and zinc oxide with subsequent fixation with protective dressing "Parasept". In addition, oral administration of synbiotic "Bifikin Forte" 20 billion CFU was prescribed. Results. Application of synbiotic in complex treatment of chronic periodontitis promotes stimulation of growth of beneficial bacteria and reduction of pathogenic microflora in periodontal pocket with subsequent reduction of intensity of inflammatory process, edema and bleeding of periodontal tissues. Positive properties of the therapeutic paste according to the developed method allow its application in clinical dentistry as an alternative method of treatment of chronic localized and generalized periodontitis of medium severity with dysbiosis of the second degree. In this case the developed method causes the increase of clinical effectiveness of treatment of periodontal diseases characterized by inflammatory-destructive process of periodontal tissues, prevention of chronic foci of infection in the maxillofacial region.

Keywords: periodontal tissues, inflammatory process, bleeding, gingival edema, gastrointestinal tract, dysbiosis, oral cavity, synbiotic, treatment, prevention.

For citation: Ushnitsky I.D., Ivanova A.A., Unusyan O.S., Ivanov A.V., Akhremenko Ya.A., Komzin K.V., Ivanova O.P., Bessonov P.P., Bessonova N.G. Method of treatment of chronic periodontitis of medium severity with dysbacteriosis. Yakut Medical Journal. 2025; 89(1): 46-51. <https://doi.org/10.25789/YMJ.2025.89.12>

Introduction. Modern research determines the multifactorial development of chronic periodontitis, which, when carrying out etiopathogenetic therapy and prevention, cause some difficulties [3]. The development of the inflammatory process is mainly associated with the aggressive impact of periodontopathogenic microorganisms with disturbances in the oral cavity microbiota, impairment of function of the dentoalveolar system [6]. In addition, poor oral hygiene, the presence of gastrointestinal diseases, decreased immunity, etc. have an important role in the pathogenesis of chronic periodontitis [1; 9]. [1; 9]. At the same time, gastrointestinal dysfunctions accompanied by intestinal dysbacteriosis cause a pronounced course of chronic periodontitis due to the activation of viru-

lence of periodontopathogenic microflora [8].

Complex treatment of periodontal diseases involves the use of a wide range of different means and methods of therapy, prevention and rehabilitation, which separately can lead to a short-term clinical effect [5; 7]. At the same time, the use of various means in clinical periodontology is often insufficiently effective, especially in the presence of microflora disorders [4].

To date, the positive properties of using synbiotics in the therapy of chronic periodontitis have been studied [2]. However, the problems of eliminating dysbiosis and the positive effect of probiotics and prebiotics on the microflora of the periodontal pocket have not been completely solved [4]. In this regard, studies

aimed at solving the above problems are relevant.

Materials and methods of research.

A clinical and epidemiological study was conducted in groups with dysbiosis (n=504) and without dysbiosis (n=732) aged from 15 to 74 years. In accordance with the requirements of the modern concept of evidence-based medicine, a randomized (study) group (n=328) with grade 2 dysbiosis, a blinded (comparison) group (n=31) without dysbiosis with moderate chronic periodontitis, and a placebo control group (n=29) without dysbiosis with moderate chronic periodontitis, where no treatment or preventive measures were taken, were formed, where the age of the subjects ranged from 35 to 48 years. The study group used the developed method for treating chronic generalized periodontitis (application for patent for invention No. 2024126815 dated 12.09.2024, a positive decision received on the grant of a patent dated 27.12.2024). At the same time, in accordance with the requirements of the modern concept of evidence-based medicine, a randomized (study) group (n=328) with dysbiosis of the second degree of severity, a blinded (comparison) group (n=31) without dysbiosis with chronic periodontitis of the middle degree of severity and a placebo-control group (n=29) without dysbiosis with chronic periodontitis of the middle degree of severity, where no treatment and preventive measures were carried out, were formed. Inclusion criteria in the study were patients with chronic generalized periodontitis of medium severity with established diagnosis of second-degree dysbiosis with concomitant GI pathologies, non-inclusion criteria were patients with chronic generalized periodontitis of mild and severe severity, without dysbiosis and exclusion criteria were patients who expressed unwillingness to participate in the study. The research was conducted in the dental polyclinic and microbiological laboratory of the Clinic of the Federal State Autonomous Educational Institution of Higher Education "North-Eastern Federal University named after M.K. Ammosov", as well as in the inpatient department of gastroenterology and bacteriological laboratory of the State Budgetary Institution of RS (Ya) "Yakutsk Republican Clinical Hospital".

Retrospective and prospective analysis of case histories with the results of clinical and laboratory and objective studies of gastroenterologists was carried out in the inpatient setting. Oral pathological processes were studied with the analysis of periodontal tissue diseases according

to the CPI (1978) periodontal index in groups with dysbiosis (n=504) and without dysbiosis (n=732). Oral hygiene index by IGR-U (1964) in groups with dysbiosis (n=464) and without dysbiosis (n=716) was studied. Periodontal index according to A. Russell (1956) was also determined in groups with dysbiosis (n=318) and without dysbiosis (n=237). The dental examination card recommended by WHO (2013) was used for the study. In addition, based on the results obtained, the need for dental care of the examined patients was determined using the method of P.A. Leus (1987).

Complex treatment in the main group was carried out using the developed method of treatment of chronic periodontitis of medium severity with dysbiosis of the second degree. In order to reduce the number of pathogenic microbial associations in the gingival biotope and to restore the oral cavity microbiocenosis in the patients of the main group for local treatment, therapeutic paste with synbiotic "Bificin Forte" 20 billion CFU was used (state registration certificate AM.01.11.01.01.003.R.000001.01.24), vitamin "A" oil solution (State Register of Medicinal Products Reg. No. RN 001778/01) and zinc oxide (State Register of Medicinal Products Reg. No. FS-001204, Safety Data Sheet in accordance with GOST 30333-2007 ROTI@nanoMETIC $\geq 99\%$, 25 nm, Article no: 8278, Version: GHS 1.0 ru), where their mass percentages are 54-55, 33-35 and 10-13%. The components were mixed until a thick cream-like consistency was obtained, then the prepared paste was introduced into the periodontal pocket and it was fixed with a protective dressing "Parasept" (registered in the Federal Service for Supervision in the Sphere of Health Care No. FSR 2007/00142, TU 9391-067-45814830-2002 dated November 16, 2020. In this case, the daily procedure is associated with a single injection of the therapeutic paste into the periodontal pocket, the course includes 8-10 procedures. In addition, "Bificin Forte" 20 billion CFU was administered orally, 1 capsule daily for 3-4 weeks. The comparison group was treated with liquid synbiotic "Normoflorin®-D", which was injected into the periodontal pocket in the volume of 0.2 ml daily for 12-14 days, followed by supragingival applications of this product for 15 minutes. In addition, patients were recommended to take 20 ml of synbiotic orally 2 times a day before meals for 30 days. For microbiological study the material from periodontal pocket (inflammatory focus) was obtained using a thin probe-tampon, which was placed in liquid

transport medium "Amies". The material was examined by real-time PCR with hybridization-fluorescence detection. The average number in statistical processing was expressed in lg CFU, where $10^1 \text{ CFU} = 1 \text{ lg CFU}$ (CFU - colony-forming unit, microbial cell).

Approval of the local ethical committee of the Medical Institute of the Federal State Educational Institution of Higher Education "Ammosov North-Eastern Federal University" was obtained for the comprehensive clinical and laboratory examination (Minutes No. 15 of October 31, 2018, decision No. 2). All participants gave voluntary informed consent before conducting the studies.

Statistical processing of the obtained materials was performed using the program "SPSS-22". The estimation of the sample volume of clinical material and its sufficient size (sample size) was carried out according to K.A. Otdelnova (1980).

Results and discussion. To date, the improvement of therapeutic and prophylactic measures for periodontal diseases is of great scientific and practical importance. In view of the above, we evaluated the prevalence and intensity of periodontal tissue diseases in the examined age groups with and without dysbiosis (Table 1). Thus, the average prevalence of periodontal diseases in the examined age groups without dysbiosis is $88.58 \pm 0.06\%$, while in the group with dysbiosis $90.78 \pm 0.06\%$ ($p < 0.05$). At the same time, the maximum prevalence of periodontal diseases was found in the age group 45-54 years, where the index in the group without dysbiosis was $95.67 \pm 0.08\%$, and with dysbiosis - $97.33 \pm 0.04\%$ ($p < 0.05$), and the minimum level was found in the age group 65-74 years - $72.54 \pm 0.77\%$, and with dysbiosis - $73.79 \pm 0.69\%$ ($p > 0.05$), which is associated with the presence of individuals with complete tooth loss in the groups. Meanwhile, in the indices of healthy individuals without periodontal disease sextants, there is a definite pattern of maximum decrease with age, where it was $10.46 \pm 1.56\%$ in 15-year-old adolescents without dysbiosis and $6.54 \pm 0.14\%$ ($p < 0.05$) with dysbiosis, which decrease to the level of numerical values of $0.79 \pm 0.07\%$ and $0.21 \pm 0.10\%$ ($p > 0.05$) in the groups of 65-74 years, respectively. Such symptom as bleeding in 15-year-old adolescents without dysbiosis was $38.93 \pm 0.88\%$ and with dysbiosis was $41.32 \pm 1.16\%$ ($p < 0.05\%$), and in the age group of 65-74 years without dysbiosis was $6.99 \pm 1.84\%$ and with dysbiosis was $7.28 \pm 1.77\%$ ($p > 0.05$). Meanwhile, the presence of supra- and sub-gingival tar-

Table 1

Clinical characterization of the frequency and structure of periodontal diseases in groups with and without oral dysbiosis

Age groups	Number examined	Prevalence rate (%)	CPI (%)			
			Healthy	Bleeding	Supra- and subgingival stones	Periodontal pocket
15 years	with dysbiosis (n=84)	93.46±0.14	6.54±0.14	41.32±1.16	39.94±1.19	12.20±1.81
	dysbiosis-free (n=124)	89.54±0.18 p<0.05	10.46±1.56 p<0.05	38.93±0.88 p<0.05	38.78±0.88 p>0.05	11.83±1.35 p>0.05
20-34 years	with dysbiosis (n=95)	93.59±0.13 p<0.05	6.41±1.92 p>0.05	30.27±1.30 p>0.05	45.81±0.98 p<0.05	17.51±1.56 p>0.05
	dysbiosis-free (n=220)	91.23±0.10	5.78±1.14	28.54±0.75	43.51±0.57	15.83±0.91
35-44 years	with dysbiosis (n=148)	95.77±0.06 p<0.05	4.23±1.48 p>0.05	14.18±1.26 p>0.05	41.83±0.83 p>0.05	39.76±0.86 p>0.05
	dysbiosis-free (n=234)	93.96±0.07	6.04±1.09	13.88±0.93	40.92±0.61	39.16±0.63
45-54 years	with dysbiosis (n=113)	97.33±0.04 p<0.05	2.67±1.80 p>0.05	9.03±1.63 p>0.05	34.63±1.15 p>0.05	53.67±0.80 p>0.05
	dysbiosis-free (n=95)	95.67±0.08	4.33±1.97	8.31±1.79	33.87±1.27	53.49±0.86
65-74 years	with dysbiosis (n=64)	73.79±0.69 p>0.05	0.21±0.10 p>0.05	7.28±1.77 p>0.05	16.74±1.52 p>0.05	49.77±0.64 p>0.05
	dysbiosis-free (n=59)	72.54±0.77	0.79±0.07	6.99±1.84	16.37±1.57	49.18±0.65
Averages	with dysbiosis (n=504)	90.78±0.06 p<0.05	4.01±0.70 p<0.05	20.39±0.58 p<0.05	35.79±0.46 p<0.05	34.58±0.47 p<0.05
	dysbiosis-free (n=732)	88.58±0.06	5.48±0.55	19.33±0.47	34.69±0.38	36.31±0.37
Age groups	Number examined	CPI (sextant)				
		Healthy	Bleeding	Supra- and subgingival stones	Periodontal pocket	Unaccounted sextants
15 years	with dysbiosis (n=84)	0.44±0.12 p>0.05	2.20±0.08 p>0.05	2.85±0.07 p>0.05	0.38±0.12 p>0.05	0.13±0.13 p>0.05
	dysbiosis-free (n=124)	0.42±0.09	2.17±0.06	2.83±0.05	0.37±0.09	0.21±0.10
20-34 years	with dysbiosis (n=95)	0.24±0.11 p>0.05	1.83±0.08 p>0.05	2.72±0.06 p>0.05	1.11±0.10 p>0.05	0.10±0.12 p>0.05
	dysbiosis-free (n=220)	0.22±0.06	1.81±0.05	2.75±0.03	1.09±0.05	0.13±0.07
35-44 years	with dysbiosis (n=148)	0.13±0.09 p>0.05	1.05 ±0.76 p>0.05	2.41±0.05 p>0.05	2.13 ±0.05 p>0.05	0.28 ±0.08 p>0.05
	dysbiosis-free (n=234)	0.12±0.09	1.04±0.07	2.34±0.05	2.15±0.05	0.35±0.08
45-54 years	with dysbiosis (n=113)	0.09±0.10 p>0.05	0.41±0.10 p>0.05	1.20 ±0.08 p>0.05	2.83±0.05 p>0.05	1.47 ±0.08 p>0.05
	dysbiosis-free (n=95)	0.08±0.12	0.39±0.11	1.21±0.09	2.81±0.06	1.51±0.09
65-74 years	with dysbiosis (n=64)	0.03 ±0.15 p>0.05	0.16±0.15 p>0.05	0.57±0.14 p>0.05	3.09 ±0.07 p>0.05	2.15±0.10 p>0.05
	dysbiosis-free (n=59)	0.04±0.16	0.15±0.16	0.55±0.09	3.05±0.05	2.21±0.10
Total	with dysbiosis (n=504)	0.18±0.04 p>0.05	1.13±0.03 p>0.05	1.95±0.02 p>0.05	1.90±0.02 p>0.05	0.98±0.03 p<0.05
	dysbiosis-free (n=732)	0.17±0.03	1.11±0.02	1.93±0.02	1.89±0.02	0.88±0.03

Note: the degree of reliability is determined in groups with and without dysbiosis

tar in the age group of 65-74 years without dysbiosis was $16.37 \pm 1.57\%$ and with dysbiosis was $16.74 \pm 1.52\%$ ($p > 0.05$), and in the age group of 20-34 years without dysbiosis was $43.51 \pm 0.57\%$ and with dysbiosis was $45.81 \pm 0.98\%$ ($p < 0.05$). The presence of periodontal pocket in those aged 15 years without dysbiosis was $11.83 \pm 1.35\%$ ($p > 0.05$) and with dysbiosis was $12.20 \pm 1.81\%$ and in the age group of 45-54 years without dysbiosis it was at $53.49 \pm 0.86\%$ and with dysbiosis was $53.67 \pm 0.80\%$ ($p > 0.05$).

It should be noted that there are certain clinical symptomatic features in the intensity of the course of periodontal diseases in the examined age groups, where the index of healthy sextants in the age group 65-74 years was $0.04 \pm 0.16\%$ in persons without dysbiosis and $0.03 \pm 0.15\%$ ($p > 0.05$) with dysbiosis, and in 15-year-olds without dysbiosis $0.42 \pm 0.09\%$ and with dysbiosis $0.44 \pm 0.12\%$ ($p > 0.05$), respectively. Meanwhile, the bleeding symptom in 65-74 year olds without dysbiosis was $0.15 \pm 0.16\%$ and with dysbiosis was $0.16 \pm 0.15\%$ ($p > 0.05$), and in 15 year olds without dysbiosis was $2.17 \pm 0.06\%$ and with dysbiosis was $2.20 \pm 0.08\%$, which characterizes the aggressive course of periodontal diseases

Table 2

Oral hygiene status in the surveyed groups of adolescents and adults

Age	Number of people surveyed	Dental plaque	Dental calculus	OHI-S Green-Vermillion
15 years	with dysbiosis (n=84) dysbiosis-free (n=124)	2.71 ± 0.06 $1.67 \pm 0.02^*$	1.18 ± 0.02 $1.24 \pm 0.02^*$	3.89 ± 0.08 $2.91 \pm 0.05^*$
20-34 years	with dysbiosis (n=110) dysbiosis-free (n=164)	1.73 ± 0.03 $1.31 \pm 0.01^*$	1.75 ± 0.03 $1.63 \pm 0.02^*$	3.48 ± 0.06 $2.94 \pm 0.04^*$
35-44 years	with dysbiosis (n=148) dysbiosis-free (n=234)	2.14 ± 0.03 2.09 ± 0.02	1.68 ± 0.02 $1.63 \pm 0.01^*$	3.82 ± 0.05 $3.72 \pm 0.04^*$
45-54 years	with dysbiosis (n=122) dysbiosis-free (n=194)	2.44 ± 0.04 2.41 ± 0.03	1.88 ± 0.03 1.85 ± 0.02	4.32 ± 0.07 4.26 ± 0.05
Total	with dysbiosis (n=464) dysbiosis-free (n=716)	2.25 ± 0.01 $1.85 \pm 0.01^{**}$	1.62 ± 0.01 $1.59 \pm 0.01^{**}$	3.87 ± 0.02 $3.44 \pm 0.02^{**}$

Note: —* significant differences among groups with dysbiosis and without dysbiosis; —**significant differences in the mean values of groups with dysbiosis and without dysbiosis.

Table 3

Comparative characterization of the effectiveness of the developed therapeutic paste at the stages of treatment of medium severity chronic periodontitis with second degree dysbiosis

Types of microorganisms	Quantity, lg CFU before treatment			Quantity, lg CFU by the end of treatment		
	Study group (n=328)	Comparison group (n=31)	Placebo-control group (n=29)	Study group (n=328)	Comparison group (n=31)	Placebo -control group (n=29)
<i>Tannerella forsythensis</i>	7 ± 0.02	8 ± 0.08	7 ± 0.04	3 ± 0.05	4 ± 0.21	7 ± 0.04
<i>Treponema denticola</i>	8 ± 0.04	7 ± 0.08	8 ± 0.09	3 ± 0.05	5 ± 0.13	8 ± 0.09
<i>Streptococcus oralis</i>	8 ± 0.02	7 ± 0.13	7 ± 0.04	5 ± 0.03	4 ± 0.21	7 ± 0.04
<i>S. sanguis</i>	7 ± 0.03	8 ± 0.17	8 ± 0.09	3 ± 0.04	4 ± 0.21	8 ± 0.09
<i>S. aureus</i>	8 ± 0.04	8 ± 0.13	7 ± 0.04	3 ± 0.05	5 ± 0.17	7 ± 0.04
<i>S. suis</i>	7 ± 0.01	8 ± 0.17	8 ± 0.09	5 ± 0.02	4 ± 0.17	8 ± 0.09
<i>S. constellatus</i>	8 ± 0.04	8 ± 0.13	8 ± 0.09	3 ± 0.05	5 ± 0.17	8 ± 0.09
<i>S. vestibularis</i>	7 ± 0.02	8 ± 0.21	8 ± 0.09	4 ± 0.03	3 ± 0.21	8 ± 0.09
<i>S. parasanguinis</i>	7 ± 0.03	6 ± 0.08	6 ± 0.18	3 ± 0.04	4 ± 0.17	6 ± 0.18
<i>S. cristatus</i>	7 ± 0.02	7 ± 0.13	8 ± 0.09	4 ± 0.03	4 ± 0.17	8 ± 0.09
Average for the genus <i>Streptococcus</i>	7.40 ± 0.02	7.5 ± 0.14	7.5 ± 0.11	3.75 ± 0.04	4.12 ± 0.19	7.5 ± 0.11
<i>Candida dubliniensis</i>	7 ± 0.01	8 ± 0.13	7 ± 0.04	5 ± 0.02	5 ± 0.13	7 ± 0.04
<i>Fusobacterium nucleatum</i>	8 ± 0.02	8 ± 0.08	8 ± 0.09	5 ± 0.03	6 ± 0.13	8 ± 0.09
<i>Neisseria sicca</i>	8 ± 0.01	8 ± 0.04	7 ± 0.04	6 ± 0.02	7 ± 0.08	7 ± 0.04
<i>N. elongata</i>	6 ± 0.02	7 ± 0.08	8 ± 0.09	3 ± 0.03	5 ± 0.08	8 ± 0.09
<i>N. mucosa</i>	7 ± 0.03	8 ± 0.13	8 ± 0.09	3 ± 0.04	5 ± 0.13	8 ± 0.09
<i>N. flava</i>	8 ± 0.01	7 ± 0.08	7 ± 0.04	6 ± 0.02	5 ± 0.17	7 ± 0.04
Average for the genus <i>Neisseria</i>	7.25 ± 0.02	7.5 ± 0.08	7.5 ± 0.11	4.5 ± 0.03	5.5 ± 0.13	7.5 ± 0.11

with age. Meanwhile, the conducted clinical study revealed a significant decrease in the index of supra- and sub-gingival dental calculi, where in 15-year-olds it was $2.83 \pm 0.05\%$ in the group without dysbiosis and $2.85 \pm 0.07\%$ with dysbiosis, while in the age group of 65-74 years without dysbiosis it was $0.55 \pm 0.09\%$ and with dysbiosis - $0.57 \pm 0.14\%$, respectively. Meanwhile, a similar trend is determined in periodontal pocket data, where in the group of 65-74 year olds without dysbiosis it was $3.05 \pm 0.05\%$, with dysbiosis - $3.09 \pm 0.07\%$, and in 15 year olds without dysbiosis $0.37 \pm 0.09\%$, with dysbiosis - $0.38 \pm 0.12\%$. Meanwhile, the opposite trend of increase in the indices of unaccounted sextants is determined in the age groups 20-34 years and 65-74 years without dysbiosis, where the indices amounted to $0.13 \pm 0.07\%$ and $2.21 \pm 0.10\%$, and with dysbiosis - $0.10 \pm 0.12\%$ and $2.15 \pm 0.10\%$, respectively, confirming that periodontal diseases are the main etiologic factor of tooth loss.

The examined age groups have a high prevalence rate and unfavorable tendency of clinical course of periodontal diseases with age, their clinically more severe course is determined in groups of persons with oral dysbiosis. The identified clinical features dictate the need for further research aimed at improving periodontal care for the population.

In the structure of etiologic factors of inflammatory processes of periodontal tissues, plaque, which is closely related to the state of oral hygiene, is of great importance. Taking into account the above-mentioned, we studied the state of oral hygiene (Table 2). The obtained results of oral hygiene condition in the examined age groups of adolescents and adults determine an unfavorable situation, which is associated with the presence of dental plaque and calculus identified in this study. Thus, in the age groups with dysbiosis 15 and 20-34 years old, a poor hygienic state is determined compared to the groups without dysbiosis ($p < 0.05$), where satisfactory oral hygiene was detected. At the same time, plaque and tartar data in these age groups are interpreted as satisfactory levels. In the age group 35-44 years with and without dysbiosis, the plaque and calculus data show satisfactory levels. However, the data of total IGR-U index in this surveyed group is evaluated as poor hygiene. Whereas, in the group of 45-54 years old with dysbiosis and without dysbiosis according to the data of dental plaque and calculus, as well as the total values of hygiene index, the poor hygiene state was established.

It should be noted that the average plaque index in persons with dysbiosis (2.25 ± 0.01) is characterized as a poor hygienic state, and without dysbiosis the index was within 1.85 ± 0.01 , which is interpreted as a satisfactory level. The data of tartar index in all examined age groups with dysbiosis and without dysbiosis characterize a satisfactory hygienic state of the oral cavity. The obtained average total values of IGR-U in the examined groups with dysbiosis and without dysbiosis characterize poor levels of hygienic condition of the oral cavity. In this case, in groups with dysbiosis the given plaque expresses a poor level, and in groups without dysbiosis the indicator is defined as a satisfactory value, and for tartar indicators in groups with dysbiosis and without dysbiosis is defined as a satisfactory level.

Before the treatment of chronic periodontitis of medium severity of the developed method, the data of periodontal index according to Russell in groups with dysbiosis were -3.9 and without dysbiosis - 3.2, which when interpreted characterizes periodontitis of medium severity.

The analysis of the conducted complex treatment of chronic periodontitis of medium severity in patients with second-degree dysbiosis of the large intestine characterizes the presence of certain clinical features. Thus, the microflora of the periodontal pocket is represented by gram-positive and gram-negative aerobic and anaerobic microorganisms, as well as yeast-like fungi of the genus *Candida*. Among anaerobes, gram-negative bacteria of the genus *Tannerella*, *Treponema* and *Fusobacterium* predominated in patients. The aerobic component was represented by numerous species of Gram-positive streptococci and Gram-negative *Neisseriaceae*. Species composition and average content of microorganisms in the study group, comparison group and placebo control group before and after treatment are presented in Table 3.

The results obtained after one month of complex treatment of chronic periodontitis of medium severity in the study group using the developed therapeutic paste indicate a certain restoration of periodontal pocket microbiota and reduction of opportunistic microflora in the oral cavity. Thus, the number of *Tannerella forsythensis* amounted to 3 lg CFU, *Treponema denticola* also 3 lg CFU, the average index for *Streptococcus* genus decreased to 3.75 lg CFU, for *Neisseria* genus - to 4.5 lg CFU, the content of fungi of the genus *Candida* and *Fusobacteria* decreased not so significantly and



Fig. 1. A patient with chronic generalized periodontitis of moderate severity with dysbiosis of the second degree before treatment



Fig. 2. Therapeutic paste for the treatment of chronic periodontitis of moderate severity with dysbiosis of the second degree



Fig. 3. The introduction of a therapeutic paste into a periodontal pocket with a protective bandage "Parasept" for periodontitis of moderate severity with dysbiosis of the second degree



Fig. 4. The condition of periodontal tissues after a course of therapy with a therapeutic paste with the synbiotic "Bificin Forte" 20 billion CFU in chronic generalized periodontitis of moderate severity with dysbiosis of the second degree

amounted to 5 lg CFU for both microorganisms. Thus, it can be seen that treponemes and streptococci turned out to be the most sensitive to the therapeutic effect. The similar tendency of dynamic changes of clinical picture and positive change of microflora balance are noted in patients of the comparison group. At the same time in the placebo-control group quantitative indicators of periodontal pocket microbiota remain respectively unchanged.

Dynamic change in the balance of periodontal pocket microflora in the study group was accompanied by the manifestation of positive changes in periodontal tissues at the stages of the complex treatment already on the 3rd day in the form of reversal of the inflammatory process with subsequent reduction of periodontal tissue edema and disappearance of gingival bleeding. After the inflammatory process of periodontal tissues subsided, some patients underwent surgical methods of treatment, which included open curettage or flap operations. At the end of the procedure, recommendations were given on rational oral hygiene and visits to the dentist at the place of residence 3-4 times a year for preventive examination, where treatment courses were repeated if indicated.

Pearson's chi-square analysis characterizes the presence of a relationship between the compared categorical variables, where the correlation of periodontal pocket depth and bleeding symptom is determined ($r=0,79$), *Streptococcus ogalis* and *Neisseria sicca* ($r=0,49$), *Streptococcus sanguis* and *Treponema denticola* ($r=0,52$), *Tannerella forsythensis* and *Fusobacterium nucleatum* ($r=0,81$), which causes a pronounced reverse development of periodontal tissue inflammation when using the developed method. Clinical efficacy of treatment is confirmed by Varimax factor analysis.

A clinical example. Patient S., 44 years old, turned to the dental clinic of the Clinic of the Northeastern Federal University named after M.K.Ammosov. Complaints: the presence of soft and hard dental deposits, tooth mobility with manifestations of bleeding gums during meals and when brushing teeth.

Objective: external examination – the configuration of the face is unchanged, the skin is without features, the regional lymph nodes are not enlarged, the opening is free, TMJ dysfunction on the left, the red border of the lips is without features; examination of the oral cavity – the mucous membrane of the gums in the area

1.6, 1.5, 2.5, 2.6, 3.1, 3.2, 3.3, 4.1, 4.2 and 4.3 hyperemic, edematous, bleeding during probing, the depth of periodontal pockets in the area 3.1, 3.2, 3.3, 4.1, 4.2, 4.3 it is 3.6 mm without separation, the mobility of teeth in the antero-posterior direction, the Kulazhenko test is positive and is 9 seconds (Fig.1).

According to the data provided by the inpatient discharge: the patient underwent inpatient treatment 3 months ago in the gastroenterological department of the Yakut Republican Clinical Hospital for exacerbation of gastric ulcer and duodenal ulcer, where dysbiosis of the second degree was detected.

Diagnosis: chronic periodontitis of moderate severity with dysbiosis of the second degree.

Treatment: the initial stage of therapeutic and preventive measures included professional oral hygiene and oral hygiene training. Local and general treatment is prescribed. A therapeutic paste was applied topically (Fig.2) based on the powder of the synbiotic "Bificin Forte" 20 billion CFU, an oil solution of vitamin A and zinc oxide by injection into the periodontal pocket with its fixation with a protective bandage "Parasept" for 3-5 hours (Fig.3). Additionally, Bificin Forte synbiotic was prescribed 20 billion CFU orally, 1 capsule per day for 3-4 weeks.

After the course of treatment, the patient objectively determines the reverse development of the inflammatory process with a decrease in swelling, disappearance of symptoms of bleeding and hyperemia of periodontal tissues (Fig.4). At the same time, the patient was referred to preventive courses of treatment to a gastroenterologist and consultation with a therapist, obstetrician-gynecologist and endocrinologist. The patient has been registered at the dispensary. Turnout for a repeat appointment in 2-3 months.

Conclusion. The developed method of treating chronic periodontitis of moderate severity in patients with dysbiosis of the second degree helps to reduce the number of pathogenic microbial associations in the gum biotope and restore the microbiocenosis of the oral cavity, followed by the manifestation of positive changes in periodontal tissues. At the same time, at the stages of complex treatment, the reverse development of the inflammatory process is clinically determined on the 3rd day, which confirms the clinical effectiveness of the developed treatment method, preventing further complications of inflammatory processes of periodontal tissues. In this regard, this

method has prospects for its application in clinical periodontology.

References

1. Avduev I.S. Terapevicheskie aspekty zabolevaniya organov zheludочно-kishechnogo trakta i analiz assortimenta lekarstvennykh preparatov, ispol'zuemykh dlya lecheniya i profilaktiki zabolevaniy organov pishchevareniya [Therapeutic aspects of diseases of the gastrointestinal tract and analysis of the range of medicines used for the treatment and prevention of diseases of the digestive system]. Vestnik «Biomedicina i Sociologiya» [Bulletin of Biomedicine and Sociology. 2022.73. R.80-84 (in Russ.).] DOI: 10.26787/nydha-2618-8783-2022-7-3-80-84.
2. Vecherkina Zh.V., Chirkova N.V., Shalimova N.A., et al. Analiz etiopatogeneza disbioza v stomatologii (obzor literatury) [Analysis of the etiopathogenesis of dysbiosis in dentistry (literature review)]. Vestnik novykh medicinskih tekhnologiy [Bulletin of new medical technologies. 2020; 27.(3): 11-19 (in Russ.).]
3. Bulgakova A.I., Soldatova E.S., Kuvardina Yu.O. Optimizatsiya kompleksnogo lecheniya hronicheskogo parodontita [Optimization of chronic periodontitis comprehensive treatment]. Parodontologiya [Periodontology. 2023; 28 (4): 431-436 (in Russ.).] <https://doi.org/10.33925/1683-3759-2023-840>.
4. Zykova A.S., Opravin A.S., Soloviev A.G. Parodontit kak faktor riska razvitiya serdечно-sosudistyyh zabolevaniy. Sistemicheskij obzor [Periodontitis as a risk factor for cardiovascular disease development: systematic review]. Parodontologiya [Periodontology. 2024; 29: 25-33 (in Russ.).] <https://doi.org/10.33925/1683-3759-2024-806>.
5. Iordanishvili A.K., Guk V.A., Golovko A.A. Kompleksnoe lechenie parodontita: reaktsiya pacienta na provodimuyu terapiyu [Complex treatment of periodontitis: patient's reaction to the therapy]. Parodontologiya [Periodontology. 2020. Vol.25. No.2. R.97-100. <https://doi.org/10.33925/1683-3759-2020-25-2-97-100>.
6. Miklyaev S.V., Leonova O.M., Sushchenko A.V., et al. Mikrobiologicheskij pejzazh parodontal'nogo karmana pri vospalitel'nykh zabo. levaniyakh v tkanyah parodonta [Microbiological landscape of the periodontal pocket in inflammatory diseases in periodontal tissues]. Vestnik RUDN. Seriya: Medicina [Bulletin of RUDN University. Series: Medicine. 2021; 4: 332-338 (in Russ.).]
7. Galieva A.S., Davidovich N.V., Opravin A.S., et al. Rezultaty kompleksnoy parodontal'noy terapii s primeneniem kombinatsii bakteriofaga i probioticheskogo preparata [The efficacy of bacteriophage/probiotic combination therapy in periodontal treatment]. Parodontologiya [Periodontology. 2024; 29 (1): 92-101 (in Russ.).] <https://doi.org/10.33925/1683-3759-2024-821>
8. Könnecke H., Schnabel R.B., Walther C., et al. Cross-sectional study on the association of periodontitis with arterial hypertension in the Hamburg City Health Study. European Journal of Medical Research. 2022; 27(1): 181.
9. Rodrigues JVS, Cláudio M.M, Franciscan JPS, et al. The Effect of Non-Surgical Periodontal Treatment on Patients with Combined Refractory Arterial Hypertension and Stage III, Grade B Periodontitis: A Preliminary Prospective Clinical Study. Journal of Clinical Medicine. 2023; 12(13): 4277.