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Microbial landscape of the oral cavity in chronic recurrent aphthous stomatitis

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Resume: The article describes studies of the microflora of the oral mucosa, studied the quantitative ratios of normal representatives of each biotope, as well as the presence and number of opportunistic and pathogenic microorganisms. Based on the results obtained, the author concluded that helminthic invasion worsens the degree and course of dysbiosis of the mouth and intestines, and also noted the relationship between the duration of the course of chronic recurrent aphthous stomatitis and dysbiosis of the oral cavity.

Keywords: Oral mucosa, conditionally pathogenic microorganisms, pathogenic microorganisms, microbiociosis, chronic recurrent aphthous stomatitis.

Relevance. Chronic recurrent aphthous stomatitis (CRAS) is one of the most frequent diseases of the oral mucosa (OM). A.I. Rybakov (1978) believed that CRAS accounts for 5% of all pathologies. In the 21st century, scientists call a figure of 20% of the world's population suffering from aphthae at some point in their lives, most often from 20 to 40 years. In the prepubertal period, the incidence is not gender-specific, and in the pubertal period, women are more likely to get sick [10].

CRAS is an infectious disease caused by a combination of environmental influences, micro- and macro-organisms. CRAS is characterized by frequent recurrence of aphthae on mucosal mucosa and with violation of the integrity of the epithelium, local inflammation and severe pain [1, 2, 6].

According to the WHO, almost 5 billion people in the world are infected with protozoal diseases and helminthiases, that is, the vast majority of people living on earth. Helminths treat the human body both as a source of nutrition and as a habitat and reproduction, they lead to systemic toxic damage to many organs of the host by the products of their metabolism [2, 11].

A distinctive feature of most helminthic invasions is a chronic, latent course, due to the prolonged presence of the parasite in the body and repeated repeated infections. The waste products of helminths disrupt the normal intestinal biocenosis, which undoubtedly affects the microbiocenosis of the oral cavity, contributes to the growth of the shares of opportunistic and pathogenic microflora. Even in the absence of a clinical picture of the disease, helminthiases lead to a secondary immunodeficiency state [24, 25, 27].

Despite the large number of proposed treatments, CRAS continues to be a complex and largely unresolved problem. There is an urgent need for new, more effective treatments for this disease; therefore, the search for new, optimal methods is absolutely justified.

Material and methods. On the basis of the Department of Therapeutic Dentistry of the Bukhara State Medical Institute by us for the period 2020–2022 years 97 CRAS patients aged 23-46 years (mean age 36.4±3.3 years) were examined, Of these, there were 43 men and 54 women. The average age of the observed men was 34.7±3.1 years, women - 39.2±3.2 years.

The initial diagnosis of CRAS was made according to generally accepted criteria based on complaints, a carefully collected anamnesis, the duration of the process, and an objective examination. Information about the effectiveness and methods of previous therapy was taken into account. The final diagnosis was made after studying the data of dental diagnostic methods.

Due to the lack of reference values and the inconsistency of literature data, to determine the indicators in healthy individuals, a control group was formed, which included 22 practically healthy individuals with intact oral mucosa, whose average age was defined as 32.1 ± 1.4 years, without violation of the dental arch and formula, and changes in the oral cavity and gums.

After the diagnosis of CRAS was established, the patients were divided into 2 groups.

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The division into groups was carried out in accordance with the results of the examination for helminthiases. Thus, patients with detected helminthiases were included in group I of the studied patients, they were treated for helminthiases, in accordance with the recommendations of a consultant parasitologist (Associate Professor of the Department of Infectious Diseases of BukhMi Mirzaeva M.R.)

The quantitative distribution of patients in all groups is presented in Table 1.

Table 1

Distribution of patients by groups

Patient groups	Absolute amount	part in %	Average age	Sex	
				Men Abs/ %	Women Abs/ %
Ia	25	25,77	34,5±1,8	10/23,26	13/24,07
Ib	24	24,74	35,2±2,1	11/25,58	15/27,78
IIa	24	24,74	35,2±1,7	11/25,58	12/22,2
IIb	24	24,74	36,1±1,9	11/25,58	14/25,93
KG	22		37,5±2,7	10/45,45	12/54,55
Total	97	100	36,4±3,3	43/44	54/56

In patients of all groups, the severity of the inflammatory process in the tissues of the oral mucosa was the same, and the therapeutic measures were different.

Patients of group I (49 people, 50.51%) underwent pathogenetic treatment of helminthiases against the background of standard treatment for CRAS. 48 patients (49.49%) of group II underwent standard treatment for CRAS.

Both groups were divided in the course of treatment, so in the 1a subgroup, the drug "Oil extract of garlic" was used topically and orally "Mekretin", in the 2a - the drug "Oil extract of garlic" was used topically against the background of standard therapy. Our study used clinical, dental, laboratory and statistical research mcoethods.

Methods of microbiological research. When studying the microflora of the oral mucosa, we took into acunt the number and ratio of normal representatives of each biotope, as well as the presence and number of opportunistic and pathogenic microorganisms.

Verification of the diagnosis "Dysbacteriosis of the oral cavity" was carried out on the recommendation of Khazanova V.V. with co-authors the removal of a dysbiotic shift, dysbacteriosis III degree; dysbacteriosis sh degree and dysbacteriosis IV degree [23]. (table 2.).

Colonization of the oral cavity and intestines was assessed by the composition of the microflora. The sampling of material to determine the microflora of the oral cavity was carried out according to Kravtsova E.O. (1995) [7, 8, 9]. Fecal sampling was carried out according to SanPiN No. 0342-17 [14].

Biological testing of microorganisms was carried out according to biochemical and antigenic properties [3,4,12]. The last dilution in which growth was found was taken into account. The result was expressed in lgCFU/ml

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Table 2.

Change in microbiocenosis	Characteristics of the state of microbial populations
Dysbiotic shift	Insignificant changes are characteristic - an excess of the number of one type of conditionally pathogenic microorganism while maintaining the normal species composition of the microflora of the oral cavity. This form of shift can be called latent or compensated, with it there may be no pronounced clinical signs of the disease.
Dysbacteriosis III degree	The subcompensated form is characterized by more pronounced changes in the composition of the microflora; identification of 2-3 pathogenic species against the background of a slight decrease in the number of lactobacilli. Patients with 1 P degree of dysbacteriosis, as a rule, also have clinical symptoms of the disease.
Dysbacteriosis SH degree	It is characterized by the detection of pathogenic monoculture with a sharp decrease in the number or complete absence of representatives of the normal (physiological) microflora
Dysbacteriosis IV degree	Characterized by the presence of associations of pathogenic bacterial species with yeast-like mushrooms.

Statistical processing of results. Statistical processing of the results of the study was carried out using the methods of variation statistics using Microsoft Office Excel-2019 programs with the calculation of the standard deviation and the arithmetic mean error by the method of moments (M ± m), standard deviation (□), median, mode and interquartile intervals. To determine the statistical significance of the obtained measurements, the Student's significance tests (t) and the degree of significance (P) for data with a normal distribution were used, the differences were accepted as significant at a 95% confidence interval (P□0.05).

Results and discussions. It was established that patients with CRAS had some degree of oral dysbacteriosis; intestinal dysbacteriosis was found in 36 (75%) patients in group II and 48 (97.96%) patients in group I.

It was found that the degree of dysbiotic changes in the intestine was also higher in the examined group I. Thus, the normal ratio of microorganisms in the intestines was registered in 11 patients (22.91%) of group II, in group I such patients were not registered; dysbiotic shift had 19 patients (39.58%) of group II and 4 patients (8.16%) of group I; the incidence of dysbacteriosis I and II degree was 13 patients (27.08%) in group II and 14 patients (28.57%) in group I, and the frequency of dysbiosis III degree in group I was 19 people (38.77%) and 5 (10.41%) patients in group II, while in group I, 12 (24.48%) patients had stage IV dysbacteriosis.

The frequency of occurrence of dysbiotic changes in the oral cavity is higher in group I: in the oral cavity, a dysbiotic shift was noted in 16 (33.33%) patients of group II and in 5 (10.2%) patients of group I, and the incidence of dysbacteriosis of I-II degrees was respectively 25 (52.08%) and 13 (26.53%) people; and III degree - in 7 (14.58%) and 28 (57.14%) patients, respectively; at the same time, in group I, 3 (6.12%) patients had stage IV dysbacteriosis - not registered patients of group II

Based on the results obtained, it can be concluded that helminthic invasion aggravates the degree and course of dysbacteriosis of the mouth and intestines.

We also noted the relationship between the duration of the course of CRAS and dysbacteriosis in the oral cavity. The data are given in tables 3.-5.

Table 3

Distribution of oral dysbacteriosis depending on the duration of CRAS

Degrees of oral dysbacteriosis	CRAS duration									
	Up to 1 month (n=12)		1-12 months (n=35)		1-5 years (n=43)		Over 5 years (n=7)		Total (n=97)	
	Abs	%	Abs	%	Abs	%	Abs	%	Abs	%
Dysbiotic shift	10	83,33	11	31,43	0	0	0	0	21	21,65
I-II degree	2	16,67	22	62,86	14	32,56	0	0	38	39,18
III degree	0	0,00	2	5,71	29	67,44	4	57,14	35	36,08

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IV degree	0	0,00	0	0,00	0	0,00	3	42,86	3	3,09

Table 4
Distribution of oral dysbacteriosis depending on the duration of CRAS in group I

Degrees of oral dysbacteriosis	CRAS duration									
	Up to 1 month (n=1)		1-12 months (n=15)		1-5 years (n=26)		Over 5 years (n=7)		Total (n=49)	
	Abs	%	Abs	%	Abs	%	Abs	%	Abs	%
Dysbiotic shift	1	100	4	26,67		0		0	5	10,20
I-II degree		0	9	60,00	4	15,38		0	13	26,53
III degree		0	2	13,33	22	84,62	4	57,14	28	57,14
IV degree		0		0,00		0,00	3	42,86	3	6,12

Table 5
Distribution of oral dysbacteriosis depending on the duration of CRAS in group II

Degrees of oral dysbacteriosis	CRAS duration							
	Up to 1 month		1-12 months (n=20)		1-5 years (n=17)		Total (n=48)	
	Абс	%	Абс	%	Абс	%	Абс	%
Dysbiotic shift	9	81,82	7	35		0	16	33,3
I-II degree	2	18,18	13	65	10	58,82	25	52,1
III degree		0,00		0	7	41,18	7	14,6
IV degree		0,00		0		0,00	0	

Conclusions. The frequency of occurrence of dysbiotic changes in the oral cavity is higher in group I: in the oral cavity, a dysbiotic shift was noted in 16 (33.33%) patients of group II and in 5 (10.2%) patients of group I, and the incidence of dysbacteriosis of I-II degrees was respectively 25 (52.08%) and 13 (26.53%) people; and III degree - in 7 (14.58%) and 28 (57.14%) patients, respectively; at the same time, in group I, 3 (6.12%) patients had stage IV dysbacteriosis - not registered patients of group II.

Based on the results obtained, it can be concluded that helminthic invasion aggravates the degree and course of dysbacteriosis of the mouth and intestines, and a relationship was also noted between the duration of the course of CRAS and dysbacteriosis in the oral cavity.

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