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Modern Aspects of Early Diagnosis of Oral Cavity Lesions in Coronavirus Infection

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Annotation. It has been proven that coronavirus infection (COVID-19) can influence the development of diseases of soft tissues and oral mucosa of varying severity, cause the formation of pathology of some hard structures of the oral cavity, a long-term pathological process that complicates the patient's dental status. However, early diagnosis, with the identification of frequently occurring symptoms in the form of pulpitis, periodontitis, periodontitis, stomatitis and oral candidiasis, makes it possible to prevent the formation of clinically burdened forms, timely treatment, as well as the prevention of complications - suppuration of soft tissues, loose teeth up to tooth loss. COVID-19. This analysis makes it possible to recommend the need for a dental examination and conduct index assessment methods of the oral cavity for each patient who has suffered not only a coronavirus infection, but also other viral pathologies transmitted by airborne droplets.

Key words: coronavirus pathology, COVID-19, oral pathology, early diagnosis, index assessment of the condition of the oral cavity.

Relevance. Modern healthcare throughout the world has directed its existing efforts towards studying, combating and preventing infection with the SARS-CoV-2 virus, and as practice has shown, this problem covers all branches of medicine, and damage to organs and systems is diffuse and multi-organ. According to WHO, coronavirus has the ability to spread through secretions from the mouth, including splashes of saliva, and as stated - "Cells of the salivary glands, tongue and tonsils carry the most RNA associated with proteins that are necessary for the SARS-CoV-2 virus to infect cells and everything organism" [1, 5, 14]. At the same time, isolated damage to the oral mucosa cannot be ruled out, which, together with saliva, are objects of high risk for invasion of the SARS-CoV-2 virus, and dentists become a high-risk group for developing morbidity [2, 12, 16]. Covitology experts confirm that the oral cavity can play a fatal role in transporting the SARS-CoV-2 virus deep into the body through saliva containing the virus from infected cells of the oral cavity [4, 15, 19]. Damage to the oral cavity, loss of taste and smell, neurological signs in the form of headaches, prosopalgia, deep asthenia, anxiety, phobic and depressive disorders, cognitive deficits are common clinical symptoms in the clinic of coronavirus infection [7, 10, 11, 17].

The list of coronavirus symptoms is annually and confidently updated at the time of each outbreak; infection of the oral cavity, neurological symptoms, damage to the tissue of the salivary glands, and severe forms of complications are no exception. To date, there have been many scientific studies that have proven a wide range of nonspecific lesions of the oral mucosa and subsequent neurological complications, degeneration of the oral mucosa, of various etiologies, however, the formation, diagnosis, prevention, treatment of such diseases against the background of the SARS virus have not been sufficiently studied -CoV-2.

Despite the short existence of the coronavirus infection, and the study of the ways in which its causative agent spreads, there is still no clear evidence of preventing COVID-19 by observing the rules of personal and oral hygiene. However, maintaining proper hygiene can reduce the incidence of damage to oral structures, the development of neurological complications and neurodental syndromes. There are no specific characteristics of symptoms that occur in the oral cavity, due to the virus continuing to evolve. In addition, due to the weakening of the body's protective functions, dental problems themselves can serve as a risk factor for infection, and a dental examination for COVID-19 would be correct to include in the list of necessary studies.

The purpose of the study was to develop methods for early diagnosis of damage to organs and systems by coronavirus infection in dental practice to prevent the spread and prevent complicated forms of the disease.

Research methods and materials. The scientific work was carried out based on our own observation of patients suffering from COVID-19 (SARS-CoV-2) for the period from 2019 to 2022. A total of 217 patients who sought help in outpatient and inpatient settings were subjected to a dental examination. Clinical, laboratory and instrumental studies were carried out taking into account the existing coronavirus infection, a positive PCR result for COVID-19. Clinical studies were carried out on the basis of the Bukhara Regional Infectious Diseases Hospital and the private clinic of PREMIUM-DENT GROUP LLC in compliance with all sanitary safety measures, after the permission of the chief physicians and directors of clinics and outpatient services.

For the objectivity and reliability of the results obtained, the examined 174 (80.2%) patients were marked as main group 1, suffering from oral pathology after suffering from COVID-19; Group 2 included 43 (19.8%) patients who did not have an established diagnosis of COVID-19 at the time of examination, but suffered from oral pathology, who were considered as a comparative group.

The age of the patients in the main group ranged from 17 to 71 years, with an average of 46.02±2.1 years. There were 101 (58.0%) women with an average age of 46.4±2.3 years, 73 (42.0%) men with an average age of 45.5±2.7 years. The age category of all patients was divided according to the WHO classification (2021), according to which in the main, 1st group, young (18-44 years old) were found in 80 (46.0%) cases, middle-aged (45-59 years old) and elderly (60 -74 years old) in 47 (27.0%) cases, suffering from oral pathology after suffering from COVID-19.

In the main, 2nd group, there were patients with concomitant pathology, and mainly hypertension was observed - 8 (4.6%) patients, and diabetes mellitus (DM) - 5 (2.9%) patients, while while in the comparison group there was practically no concomitant pathology.

The analysis revealed that at a young age after suffering from COVID-19, oral pathology was observed almost 2 times more, compared with middle and elderly age (P<0.01), which was also observed in the comparison group. In our opinion, this trend does not have any specific connections with the coronavirus infection; most likely, older patients refuse to go to the dentist during a pandemic in order to avoid repeated reinfections, even if there is damage to the oral mucosa, resorting to ancient methods of treatment (which is subject to careful analysis and statistical study).

However, it should also be noted that the number of women with lesions of the oral cavity in both groups was significantly higher (1.5 and 1.7 times, respectively, in groups 1 and 2), which, apparently, was associated with more fragile local immunity in the weaker sex.

Of the 174 (80.2%) patients in the main group, only 14 (8.1%) patients received cross-antibiotic therapy containing 2 or 3 antibiotics from different groups, as they suffered a severe form of pneumonia due to coronavirus pathology. The remaining 74 (42.5%) patients received one type of antibiotic during the course of the disease and 86 (49.4%) patients received virtually no therapy. The analysis revealed that in 12 (6.8%) patients, oral diseases began during the height of the coronavirus infection, in 58 (33.4%) 1 week after recovery, while 104 (59.9%) patients noticed the development of oral pathology after about 1 month, i.e. in a longer period after suffering from COVID-19, which, apparently, was associated with a weakening of systemic and local (in the oral cavity) immunity against the background of coronavirus infection. Among patients in group 1, 28 (16.1%) patients reported a severe course of COVID-19, 96 (55.2%) suffered a moderate form, the remaining 50 (28.7%) suffered from a relatively mild form, with damage to the ENT organs, headaches, one or another impairment of cognitive activity.

When performing the "tension" test, 48 (27.6%) patients had purplish-red gums, 64 (38.8%) had white plaque on their gums, 15 (8.6%) had bleeding from the gums, exposed necks of teeth due to gum recession were observed in 34 (19.5%) patients, 18 (10.3%) had purulent discharge from the gum pockets, and 42 (24.1%) complained of burning, itching and pain in the gum areas. In addition, there were symptoms of damage to the oral mucosa and some of its structures, as shown in Table 1. Patients in group 2 suffering from somatic pathology had significantly more frequent hyperemia in the oral cavity and plaque on the tongue compared to the first, main group. Malodor/halitosis was a common symptom in both groups 1 and 2 of patients.

Meanwhile, in group 1, the most common symptoms were cracks, erosions, ulcers, and rashes in the oral mucosa, which contributed to early diagnosis and prevention of further development of aggravating symptoms of COVID-19 in the oral cavity, which led to cost-effectiveness, as in material and time terms (Table 1).

Table 1

Symptoms of damage to the mucous membrane and some structures of the oral cavity

Symptoms	1-group (n=174)		2-group (n=43)		Note
	abs	%	abs	%	

Oral hyperemia	98	56,3	32	74,4	P<0,05
Bad odor/halitosis	132	79,9	34	79,1	P=0,00001
Coated tongue	110	63,2	36	83,7	P<0,01
Cracked tongue	78	44,8	16	37,2	P<0,05
Rashes on the oral mucosa	77	44,3	8	18,6	P<0,001
Cracks and redness in the corners of the lips	72	43,4	9	20,9	P<0,01
Ulcers on the oral mucosa	28	16,1	3	7,0	P<0,0001
Erosion on the oral mucosa	49	28,2	6	14,0	P<0,01
Aphthae on the oral mucosa	33	19,0	2	4,7	P<0,001
Plaques on the oral mucosa	42	24,1	3	7,0	P<0,001
Pain in teeth when biting	38	21,8	3	7,0	P<0,0001
Increased enamel sensitivity	34	19,5	2	4,7	P<0,001

Following from the analysis, patients suffering from or having had COVID-19, even in the absence of concomitant pathology, have serious problems with systemic and local immunity, and therefore deep lesions of the oral mucosa and some of its other structures that require special care may develop, treatment and prevention of further complications. Thus, the fact of antibiotic

Lymph nodes and some	1-group	2-group	Note

therapy remains controversial for the development of oral pathology against the background of COVID-19, which requires further, more detailed tests, with laboratory diagnosis of some pro- and anti-inflammatory markers in the hemogram.

Leukoplakia with characteristic lesions of white and gray color, up to 2 cm in size, rough changes in the oral mucosa and hardening in the area of the lesions, pain and discomfort when chewing, talking, brushing teeth;

Thus, the picture of pulpitis was observed significantly more - 2.8 times in patients of group 1 (P<0.001), with characteristic paroxysmal, short-term pain of the affected tooth, swelling and an increase in pulp size. The pain intensified when applying cold or hot lotions or compresses. Probing revealed a deep cavity and a painful bottom.

Table 2

Oral diseases identified in the studied patients

glands	(n=174)		(n=43)		
	abs	%	abs	%	
Pulpitis	57	32,8	5	11,6	P<0,001
Leukoplakia	35	20,1	9	20,9	P=0,0001
Periodontitis	44	25,3	10	23,3	P=0,0001
Candidiasis	47	27,0	6	14,0	P<0,05
Stomatitis	54	31,0	6	14,0	P<0,01
Periodontitis	63	36,2	12	27,9	P<0,05

Periodontitis with characteristic redness, swelling and bleeding of the gums, pathological mobility of some teeth, increased sensitivity of the enamel, pain when biting, discharge of pus from under the gums and halitosis were characteristic of almost both groups equally, without significantly differing from each other. Meanwhile, candidiasis (P<0.05) and stomatitis (P<0.01) were significantly more common in the group of patients who had COVID-19. Candidiasis manifested itself in several forms - acute pseudomembranous candidiasis, which was mostly asymptomatic, with discomfort in the oral cavity, a white film on the tongue and the appearance of plaques in 12 (6.9%) patients of group 1 and 1 (2.3%) patient of group 2.

Atrophic candidiasis of the oral cavity - with a strong burning sensation and red surface of the tongue, a change in taste in the mouth from metallic to salty and bitter was noted in 14 (8.1%) patients of the first group, and 3 (1.72%) patients of the 2nd group; chronic hyperplastic candidiasis was observed in 21 (12.1%) patients who had COVID-19, and 2 (4.7%) patients of group 2, which was recognized by the presence of widespread thrush in the oral cavity: on the mucous membranes of the cheeks, corners of the mouth and lips, the back of the tongue, the soft palate, the appearance of white plaques, in some places prone to merging with each other.

Stomatitis, observed in 27.6% of patients from the total sample, complained of acute and severe pain in the oral cavity, aggravated by chewing food and talking, increased salivation, halitosis, the formation of red, single ulcers with a white film in the middle, and minor bleeding from gums. This condition significantly prevailed in patients of the main group (P<0.01). 18 (10.3%) patients from group 1 had an increase in body temperature to 39°C, despite the fact that 7 to 12 days had passed after the coronavirus infection, which proved the continuous struggle of the body's immune system with residual effects or consequences COVID-19.

Periodontitis, the development of which was associated with pulpitis after suffering from COVID-19, also prevailed in patients who had suffered coronavirus infection (P<0.05), and was characterized by an inflammatory process of the apex of the tooth root and adjacent soft tissues. Patients complained of severe chronic pain in the teeth, radiating to the lower and upper jaw, slight purulent discharge from the gums, unpleasant odor and loose teeth, which required immediate intervention.

Often, in patients who had COVID-19, several of the listed oral pathologies occurred simultaneously (Table 2).

Thus, coronavirus infection (COVID-19) can influence the development of diseases of soft tissues and oral mucosa of varying severity, cause the formation of pathology of some hard structures of the oral cavity, a long-term pathological process that complicates the patient's dental status.

Conclusions:

1. Following from the analysis, patients suffering from or having had COVID-19, even in the absence of concomitant pathology, have serious problems with systemic and local immunity, as a result of which deep lesions of the oral mucosa develop, which require special care, treatment and prevention of further complications.

2. Coronavirus infection (COVID-19) can influence the development of diseases of soft tissues and oral mucosa of varying severity, cause the formation of pathology of some hard structures of the oral cavity, a long-term pathological process that complicates the patient's dental status.

3. Early diagnosis, with the identification of common symptoms in the form of pulpitis, periodontitis, periodontitis, stomatitis and oral candidiasis, makes it possible to prevent the formation of clinically burdened forms, timely treatment, and the prevention of complications.

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