



## Comparative Clinical and Microbiological Assessment of the Use of Various Methods of Rehabilitation of Inflammatory Diseases of the Oral Cavity in Patients Infected with Coronavirus Infection

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**Abstract:** Coronavirus disease (COVID-19) caused a full-fledged global pandemic with severe acute respiratory syndrome in 2020. According to the World Health Organization (WHO), by July 2020, 15 million cases of COVID-19 were registered, including more than six hundred thousand deaths. At the same time, there were reports from a number of countries, in particular China, Italy and the USA, showing differences in the effects of the disease depending on the gender of patients. Thus, it has been established that the disease affects men and women differently in terms of the outcome of infection and the impact on society.

**Keywords:** clinical and microbiological assessment, inflammatory diseases of the oral cavity, coronavirus infection.

**Актуальность.** Coronavirus disease (COVID-19) caused a full-fledged global pandemic with severe acute respiratory syndrome in 2020. According to the World Health Organization (WHO), by July 2020, 15 million cases of COVID-19 were registered, including more than six hundred thousand deaths. At the same time, there were reports from a number of countries, in particular China, Italy and the USA, showing differences in the effects of the disease depending on the gender of patients. Thus, it has been established that the disease affects men and women differently in terms of the outcome of infection and the impact on society.

Thus, men get sick harder than women and more often die from the disease, while the mortality rate is more than 20%. Men, especially those around the age of 50, are at the greatest risk of death from COVID-19. In China, the mortality rate from COVID-19 is 2.8% for men and 1.7% for women. In Europe, 57% of those infected with COVID-19 are men, of which 72% of deaths are men, but the incidence of the virus varies slightly by gender — the ratio is 1:09. The reasons for this gender difference are unknown, but it is believed that genetic, immunological, hormonal, social and behavioral factors are important.

Although the exact reason for this discrepancy is unknown, researchers have proposed different options for why this virus, known as SARS-COV-2, affects women and men differently. Several potential causes surround social determinants of health, such as smoking or wearing masks to prevent infection. Others are related to biological factors that have been obtained as a result of previous extensive studies that have shown significant differences in the immune system of women and men [1.3.5.7.9.11].

Acute and chronic periodontitis was also a frequent disease in children with immunodeficiency conditions caused by COVID-19 infection. Thus, the total proportion of periodontitis, both acute 32 (19.2%) patients and chronic 27 (16.2%) patients accounted for 23.6% of the total number of diseases, while yielding periodontal disease 10.8%.

In addition, we noted 2 cases of cheilitis with a wave-like flu-like syndrome without an acute onset of the disease, which resembled an adenovirus infection and differed in the duration of the clinical

course, over 3 weeks. The mucous membrane of the oral cavity is moderately diffusely hyperemic, pasty, the palatine tonsils are hyperemic, the vessels of the posterior pharyngeal wall are injected with pronounced polyadenopathy.

In this study group, the influence of a set of standard traditional oral sanitation measures in patients with coronavirus infection was studied.

The effectiveness of standard traditional sanitation measures was assessed using subjective feelings of patients, visual clinical assessment of dental status and data from microbiological methods of oral cavity research.

Clinical observations have shown that the use of standard traditional oral sanitation measures in COVID-19 infected patients slightly reduces the clinical symptoms of inflammatory processes after 5-7 sessions, which explains the duration of the 10-day course. It is important to note that out of 54 patients in this group, after the use of traditional rehabilitation measures, only 11 (20.3%) cases showed a significant improvement in the clinical picture. In all other 43 (79.7%) cases, pain and burning sensation in the oral cavity, as well as manifestations of clinical symptoms of periodontitis, persisted. Patients noted anxiety, irritability, pain, lack of appetite, etc.

After 5-7 sessions of traditional sanitation, there was a slight decrease in hyperemia and swelling of the loose mucous membranes of the oral cavity, in addition, there was a decrease in purulent plaque and discharge from the gums, but despite the positive dynamics in the gums, a large number of purulent plugs with bleeding foci of destruction during sanitation remained.

Only after 10 sessions of traditional sanitation and irrigation of the oral cavity, there was a decrease in the number of purulent plugs when rinsing the gums, and bleeding with mucosal damage persisted, and therefore the number of sanitation measures for the course of treatment increased on average to 14-16 times.

In recent years, in clinical practice, various indices are often used to characterize many diseases, which help in the diagnosis, assessment of severity and prognosis of the course, including in the pathology of the oral mucosa of infected COVID-19 patients [2.4.6.8.10.12.14.15].

It was revealed that the quality of oral hygiene is directly proportional to the sanitation of the oral cavity in patients with COVID-19, and the best result was achieved with the domestic drug FarGALS. So, after the sanitation by FarGALS, the hygienic index was  $1.5 \pm 0.2$ , which is regarded as the upper limit of a good hygienic index. In turn, with traditional sanitation, they are  $2.6 \pm 0.2$ , which is a poor indicator of the hygienic index. and when sanitized with a solution of chlorophyllipt vialain  $1,9 \pm 0,1$ , which corresponds to the upper limit of the satisfactory hygienic index. In addition, we noted that in patients after oral sanitation with FarGALS, bad breath was less pronounced than during sanitation with a solution of chlorophyllipt vialain and traditional antiseptic drugs.

When assessing nonspecific resistance during oral sanitation with FarGALS in patients with COVID-19, the content of lysozyme in saliva was studied as a local protection factor, while mixed unstimulated saliva was studied [13.15].

It was revealed that after a course of oral sanitation measures with FarGALS solution in patients with COVID-19, there was an increase in lysozyme activity in saliva, titer  $1:390 \pm 100$ , than before treatment  $1:120 \pm 50$ . The fact of an increase in the activity of saliva lysozyme confirms the strengthening of local protection factors in assessing the nonspecific resistance of the body and indicates a favorable type of reaction, in contrast to sanitation with traditional antiseptic agents and chlorophyllipt vialain solution.

A comparative analysis of the microbiocenosis of the oral mucosa of patients with COVID-19 revealed that both traditional antiseptic solutions and a solution of chlorophyllipt vialain are inferior to FarGALS in antibacterial and especially fungicidal activity [9.11.13.15].

It should be noted that when comparing the antibacterial activity against the most common coccal flora, FarGALS and neutral anolyte showed almost equal effectiveness, whereas, with respect to

fungicidal activity, the chlorophyllipt vialain solution  $639\pm55$  is 2.5 times less effective than FarGALS  $248\pm43$ .

### Conclusions:

1. A comparative clinical and microbiological assessment of various methods of oral sanitation in COVID-19 infected patients revealed that traditional antiseptic solutions are inferior in effectiveness to chlorophyllipt vialain and the domestic drug FarGALS.
2. The positive effect of the oral cavity sanitation of COVID-19-infected patients with traditional antiseptic solutions is achieved after 14-16 sanitation measures, which leads to a decrease in the hygienic index by 40% with minimal effect of this method of sanitation on the nonspecific protective functions of the oral mucosa and pronounced processes of tissue degradation and destruction.
3. Inflammatory reactions in the tissues of the oral mucosa of COVID-19-infected patients by the end of the course of rehabilitation measures with chlorophyllipt vialain are hypoergic, edema phenomena decrease but do not disappear, resulting in hemorrhages in the lumen of the emptied gingival passages between the crypts, which supports the inflammatory response and promotes the development of infectious relapses.
4. The use of the Far HALS solution in the complex treatment and sanitation of the oral cavity in COVID-19-infected patients significantly and in a shorter time, reduces the clinical symptoms of inflammatory processes in bacterial and fungal infections, improves the hygienic index by 43%, reduces up to complete reduction of inflammatory phenomena, enhances nonspecific protective functions mucous membranes of the oral cavity.

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