

# STUDY OF THE EFFECT OF LOW-INTENSITY LASER RADIATION ON THE ORAL CAVITY'S PATHOGENIC MICROORGANISMS

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**Introduction.** Human oral cavity – one of the biotops of the human body, the mucous membranes of which are inhabited by microorganisms. Violation of the balance of symbiotic microflora leads to the development of dysbiotic disorders. Among the etiological factors of dysbiosis, the most important role is played by conditionally pathogenic microorganisms, among which, in most cases, drug-resistant strains are detected. One of the main factors of inflammatory and dystrophic processes of diseases of hard tissues of teeth is microbial film (dental plaque), which has a large number of microorganisms that have high pathogenicity, properties of adhesion and invasion on the surface of teeth and tissues.

Given that the use of modern antimicrobial drugs is accompanied by the development of adverse reactions in the form of allergic reactions, toxic reactions and disorders of the functions of individual organs, special attention is attracted by physical factors: ultrasound, temperature, irradiation. Among the listed factors, special attention is drawn to the application of laser radiation, whose wide range of biological effects makes it possible to carry out highly effective measures of a complex nature.

The unique properties of a laser beam have opened wide possibilities of its application in various fields: dentistry, surgery, therapy and diagnostics. Clinical observations over 15-20 years showed the effectiveness of the ultraviolet, visible and infrared spectrum laser for local application and action on the whole body. The effect of low-intensity lasers on biological tissues leads to rapid decay of acute inflammatory events, stimulates reparative processes, improves tissue microcirculation, normalizes the general immunity, increases the body's resistance. In this regard, it can be assumed that the use of dental low-intensity laser radiation for treatment can provide an effective antiseptic effect. This led to the direction of this study.

**Aim.** The aim of the work was to evaluate the nature of the influence of low-intensity laser radiation (LILR) of the green spectrum on cariogenic microorganisms.

**Materials and methods.** Studies have been conducted with the use of classical microbiological methods. Samples were collected with sterile cotton swabs, washed in a physiological solution (1 ml) in sterile tubes and delivered to the bacteriological laboratory during which they were sown on nutrient media for 2 hours. The meat-peptone agar, sugar soup were used as a nutrient medium. The culture medium was cultured using a bacterial loop using Gold's method. Cultivation of the material on nutrient media were carried out in a thermostat at  $T=37^{\circ}\text{C}$  for 24 hours. Cups with anaerobic cultures were placed in a microanaerostat, and then into a thermostat. The identification of isolated pure cultures were carried out according to morphological and cultural properties in accordance with generally accepted methods. To determine the influence of LILR on cariogenic microorganisms. The effect of laser radiation was studied with a wavelength of 445 nm and 650 nm (power density 100 mW / cm<sup>2</sup>).

**Results and discussion.** The obtained results showed that the use of low-intensity laser radiation of the green spectrum for 10 seconds is not accompanied by changes in the quantitative significance of the population of microorganisms. Extending the exposure time to 30 and 60 seconds revealed a slight decrease in the number of microorganisms (2.3% – 3.6%), according to control. With an increase in the duration of laser irradiation up to 120 seconds, the microbial population in all groups decreased by 1.3 times.

**Conclusions.** Thus, it has been proved that under the experimental conditions, low-intensity laser radiation of the green spectrum reveals a pronounced antiseptic effect, which was expressed in the reduction of the amount of microorganisms by 1.3 times.