

HEMODYNAMIC PARAMETERS OF PERIODONTAL TISSUES WITH
PARTIAL SECONDARY ADENTIA.

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Summary

The paper examines the state of microcirculation of periodontal tissues of the supporting teeth and in the area of the dentition defect by laser Doppler flowmetry in patients with various dentition defects. The indicators of periodontal microcirculation have their own topographical features, which is confirmed by similar studies conducted earlier at the department.

Key words

periodontal disease, adentia, dentition, microcirculation, periodontal disease, alveolar process, metabolic homeostasis, microvessels, laser Doppler flowmetry.

Relevance. One of the most common pathologies of the maxillary system is partially secondary adentia (SVA). The causes of CHA are different, the most common of them are: complications of dental caries, periodontal diseases, injuries, operations for CHL neoplasms, etc. All organs of the maxillary system are closely related to each other. Changing one of them, as a rule, causes a violation of the form and function of the other. During the act of chewing, constantly shifting zones of low and high pressure appear in the periodontium, as a result of which blood is alternately sucked into these areas of tissue and then ejected from them. The reaction of the vessels of the periodontal microcirculatory network, the main link providing metabolic homeostasis, to the functional load has not been sufficiently studied. Changes in periodontal microvessels can indicate the onset of trophic disorders in periodontal tissues. Objective registration of microcirculation status by laser Doppler flowmetry (LDF) is used in various fields of medicine. However, at present, the issues of changes in periodontal hemodynamics in CVA, depending on the size of dentition defects, have not been sufficiently studied and insufficiently covered.

The purpose of the study. Taking into account the fact that LDF makes it possible to analyze macrocirculatory parameters, we have undertaken this study in order to comprehensively study hemodynamics, as well as to identify some patterns of changes in microcirculation of periodontal tissues in individuals with CVA, depending on the size of dentition defects.

Materials and methods. The examination of patients was conducted at the Department of Orthopedic Dentistry Faculty of TSSI. We examined 37 patients aged 30 to 65 years. All the subjects were divided into 3 groups: Group I: 15 patients with minor dental defects; Group II: 10 people with moderate defects and group III: 12 people with major dental defects. The control group consisted of 15 people aged 25 to 45 years with an intact dentition. Laser Doppler flowmetry was performed on a LAKK-01 device with a single-channel analyzer (LAZMA, Russia). The radiation source of the device is a helium-neon laser (0.63 microns, 25mW) with a standard diagnostic probe. The analyzer has an interface unit that allows you to connect the device to a computer of any configuration. Combined with a computer, the device allows you to obtain high-quality LDF-grams, graphs of the analysis of amplitude-frequency characteristics.

Results and discussion. As a result of studies of periodontal microcirculation in the control group, it was revealed that the normal microcirculation index (PM) of the alveolar ridge is unequal in the area of different groups of teeth. In general, this indicator is higher in the upper jaw than in the lower jaw. The maximum values of PM are observed at the premolar level. At the same time, the level of perfusion of the incisors and canines of the lower jaw is higher than in the upper jaw. The limit of fluctuations in the perfusion level is 5.6 cu. In turn, IEM in the lower jaw was lower in all departments. The limit of fluctuations of this parameter was 0.37 cu. The maximum values are observed at the level of 2-3 molars of the upper jaw. The average Kv value of the control group is 25.8 ± 0.6 cu. Thus, the indicators of periodontal microcirculation have their own topographic features, which is confirmed by similar studies conducted earlier at the department.

When examining periodontal tissues in the area of the supporting teeth in patients with small defects, the microcirculation level was reduced by reducing capillary blood flow by 12%, its intensity by 15%, and vasomotor activity of microvessels by 29% compared with the norm, indicating a decrease in periodontal tissue trophism. With medium and large dental defects, the blood flow level was reduced by 17%, its intensity by 21%, and the vasomotor activity of microvessels by 48%, compared with the norm, indicating a decrease in tissue perfusion with blood.

Thus, an analysis of the results of microcirculation indicators showed that in the periodontal tissues in the area of the supporting teeth of a partial dentition defect, the level of microcirculation significantly decreases compared to the data of the control group. As the extent of the partial dentition defect increases, the indications of microcirculatory changes increase. Analysis of the amplitude-frequency characteristics of LDF-grams revealed a reduced level of Kv (coefficient of variation) of tissue blood flow in the periodontal teeth in the area of a partial

defect by 24% with a small defect and by 39% with medium and large defects compared with the norm, which indicated a decrease in active modulation of tissue blood flow. In the periodontal tissues in the area of the partial dentition defect, there was a more pronounced vasoconstriction compared to the control parameters: with a small defect, vascular tone was increased by 23.5%, with an average defect, it was increased by 39.4%, with a large defect, it was significantly increased by 54.5%.

Conclusion. Thus, in the area of the dentition defect in the periodontal tissues of the supporting teeth, the microcirculation efficiency was reduced (by 11-19%), due to a decrease in the myogenic activity of microvessels (by 37-40%) and associated with a deterioration in microcirculation. The change in the rhythmic structure of tissue blood flow was objectively reflected by the dynamics of the flaxmotion index, which decreased by 10-18% as the length of the dentition defect increased.

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