

**VIBROACOUSTICS IN MEDICINE**  
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**Vibroacoustic Effect on Microcirculation in  
Periodontitis.**

Periodontal diseases currently present one of the important and complicated problems among all other dental diseases. Microcirculation disorder is the leading link in the pathogeny of this disease, resulting in the slowing blood and lymph flow, thrombus formation, narrowing of capillary lumen and its form changing. The increase of vascular permeability leads to vascular walls and perivascular tissue getting saturated with proteins, such as albumin, fibrin-fibrinogen, immunoglobulins etc. Formation of thick inflammatory infiltrates with the predominant concentration of lymphocytes and plasma cells changes sharply the normal gum structure. The ground substance of the gum's conjunctive tissue is being depolymerized due to the increased activity of tissue and microbe hyaluronidase. Collagen breaking is observed. Venous outflow is disrupted. The growing progressively pathological changes lead to the inflammation spreading to the alveolus bone tissue and periodontium, resulting in bone tissue resorption in these structures.

Patients complain about an unpleasant sensation, itch, bleeding and suppuration in the gum area. Teeth mobility is noted.

At examination, it was found that gum mucous acquired cyanotic colour indicating congestive events in periodontium. Dentogingival pockets extract purulent effluent at palpation; teeth mobility of various degrees is noted, depending on the periodontitis stage.

Based on therapeutic characteristics of vibroacoustic effect, we used this physical factor in a complex treatment of slight and medium periodontitis.

We had 30 patients under our observation. All patients were divided into three groups: Group 1 – 10 patients with slight periodontitis; Group 2 – 10 patients with medium periodontitis; Group 3 – control group subdivided into two smaller groups of 5 people each with slight and medium stages of periodontitis.

The purpose of our research was to develop the methods of treatment procedures and control by additional methods of examining therapeutic effect of vibroacoustic exposure using Vitafon-2 apparatus.

All patients underwent thermometry and Laser Doppler Fluometry prior to treatment in the attached gum area.

Vibroacoustic exposure using Vitafon-2 was tested on patients of groups 1 and 2 only. Group 3 patients underwent standard periodontitis treatment without vibroacoustic oscillations.

Vitaфон-2 procedures were carried out by the following methodology: vibrophones were attached externally on skin projection of the upper and lower jaws with four fields; the time of application on each field was 5 min, the apparatus mode - "3", the energy level - stage 2. The course of treatment consisted of 10 procedures carried out daily or every second day.

On the following day, the patients after a course of treatment and the control group patients after a standard treatment of periodontitis underwent repeated thermometry and Laser Doppler Fluometry.

Thermometry was done in the attached masticatory and central teeth gum area of the upper and lower jaws. After a course of treatment the temperature in all gum areas increased 1-1.5°C in Group 1 and 2 patients. The temperature changes in Group 3 did not have any practical significance.

Laser Doppler Fluometry was carried out in the same gum areas as the thermometry. We looked at AQD index - Average Quadratic Deviation of blood flow vibrational amplitude from microcirculation simple average.

AQD reflects modulation mechanisms of tissue blood flow (myogenous, neurogenetic, respiratory and pressure changes).

After a course of procedures this index increased in Group 1 and 2 patients, and stayed the same in Group 3.

Clinical mucous tunic of the gum became pink-pale and firm. The depth of dentogingival pockets decreased. The patients have noted reduced gum bleeding or its absence.

Thus, the received results show the effectiveness of vibroacoustic therapy using Vitafon – 2 apparatus for the treatment of patients with slight and medium periodontitis by the developed by us methodology.

*The graphics and photographs in this articles will be amended in the future.*