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Vibroacoustic Effect on Regional Blood Flow.

Theoretic substantiations of systematic vibroacoustic effect on kidney area examine a concept of kidneys' improved productivity in maintaining acid-base equilibrium of blood. Improved kidney functioning, in its turn, allows the organism to increase the outflow of disbalancing metabolism and catabolism products from tissues and therefore to increase the tone of venous and lymphatic vessels, improving local blood circulation. Earlier, rheography method was used to prove that regional blood flow in various parts of the organism improved after vibroacoustic exposure on kidney area.

The purpose of our research is to study this effect using the Laser Doppler Fluometry Method both during the exposure and after it.

The Laser Doppler Fluometry Method is based on tissue intubation by laser radiation and a later registration of radiation reflected from the moving and static tissue components. The LDF signal characterises blood flow in microvessels to the capacity of 1-1.5mm³ of tissue. Capillary blood flow characteristics represent Microcirculation Parameter (MP), which serves as a function of erythrocytes concentration in the probed tissue volume (Ner) and their averaged speed (Vave): $MP = Ner \cdot Vave$.

Thus, MP is determined by three factors: volumetric

content of erythrocytes in blood, the number of functioning vessels in the measured tissue volume and blood circulation speed. Functional variations of these factors are considered to be the most reliable at LDF. Normally low-frequency ALF oscillations (vasomotions) prevail. Increase and/or domination of AHF oscillation amplitude may be observed at tissue ischemia and inconsistency of venous section of microcirculation channel. High-amplitude oscillations of ACF-range may be observed in congestive phenomena in venous section and may dominate in blockade and complete blood stasis.

We examined 5 patients with reduced regional blood flow. Amplitude of ALF-oscillations increased twice on average during tinting, three times after tinting, and 20 minutes after tinting – 5 times compared to the patient's condition before tinting. These facts indicate a considerable improvement in regional blood flow mainly due to improved venous outflow.