CLINICAL-DIAGNOSTIC PARAMETERS FOR COMPLEX INVESTIGATION OF MICRO-HAEMODYNAMICS AND OXYGEN TRANSPORT IN THE SYSTEM OF MICROCIRCULATION

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ABSTRACT

<u>The aim of the study</u>. Development of complex clinical-diagnostic criteria for combined evaluation of micro-haemodynamics parameters and parameters of blood oxygenation in the system of microcirculation.

<u>Materials and methods.</u> Laser Analyzer "LAKK-02", modification 4 (RF), with the Laser Doppler Flowmetry (LDF) channel and the Reflectance Tissue Oximetry (RTO) channel. Combined multi-fiber optical probe with a 3 mm diameter of the distal end. Software LAKK 2.20.510. Equipment allows a doctor to register simultaneously three different parameters in the system of microcirculation: tissue's blood perfusion (M), average functional saturation of oxy-haemoglobin fraction in the blood (SO2) and a relative volume of all fractions of haemoglobin into a tested tissue volume (Vr). Investigation was done under the rest condition as well as under an occlusion test on the 2-nd finger of a hand.

<u>Results.</u> The most informative clinical-diagnostic parameters under the rest condition are: *an index* of perfusional saturation of the oxygen in a blood SO2_m=SO2/M, which is inversely proportional to a speed of oxygen utilization by a tissue, and a parameter of a specific oxygen utilization in a tissue U=(100-SO2)/Vr, which indicates a total oxygen uptake per unit volume of circulated blood. Under the occlusion test with a pressure of 220 mm Hg, when forward and outward blood fluxes have been blocked, an additional informative parameter was a relative saturation decrease under the tissue's ischemia S_d = (SO₂^t - SO₂^{to})/M₀, where SO₂^{to} and SO₂^t are the saturation SO2 before occlusion (start time of occlusion period. Parameter S_d can be determined for time t=t₁=15s and t=t₂=180s since the beginning of occlusion. In this case there is interesting parameter the subtraction between S_d⁻¹ µ S_d⁻² for time points t₁ and t₂ as well.