

Tissues, Pathology, and Diagnostic Microscopy

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Correlation of the forms of erythrocytes, microcirculation and ultrastructure of cell in pathology and laser influence.

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A number of pathologic conditions: peptic ulcers, liver cirrhosis, dermatoses, myasthenia etc. are accompanied with increase of pathologic forms of erythrocytes - PFE in peripheral blood. Increase of the share of PFE determines disturbances of microcirculation, and is associated with characteristic cellular changes in corresponding organs, which all represent the structural base of pathologic processes [1,2].

Laser irradiation on pathologic areas (local laser irradiation - LLI) as well as intravascularly irradiation of peripheral blood - ILIB) is the effective method for reducing the mentioned changes. [1,2]. Analysis of correlations between the ratios of erythrocyte forms, parameters of microcirculation, structure of pathologically changed organs and actions of laser had not been performed before. This determined the objectives of present work: to find interdependence between the ratios of erythrocyte forms, level of microcirculation and reduction of ultrastructural alterations of cells under influence of laser therapy-LT.

Structural changes of organs in pathology and shifts in the ratios of forms of erythrocytes (mainly ratio of discocytes (D) to PFE) in peripheral blood as well as those sampled from areas of lesions were studied by means of light, transmission, scanning electron microscopies, and morphometry. The range of pathologies included hemorrhages, hepatic encephalopathy, myasthenia, some dermatoses, acne and post-acne scars. ILIB was administered every other day (10-12 sessions in total) with "Matrix-VLOK", with attached to it irradiating nozzle, which emits waves with length of 0.63 microns, output power – 1.5-2 mW, and supplied with special Teflon coated needles. The parameters of LLA on pathologic foci were following: exposition time 5 min, frequency 1000 Hz, every day, number of session 5-10. Microcirculation was assessed with LAKK-01 and Vostok-DVA-01

In all, studied types of pathologies there were some variants of changes in the ratio of D and PFE. Depending on type of pathology there can be 1.5 – 2-fold decrease of the normal share of D, while share of some PFE may increase 1.5 to 10-fold. This is accompanied by corresponding specific changes of microcirculation and of ultrastructure in the areas of lesions in organs. It is characteristic that the share of PFE in the blood sample taken from foci of lesions 1.5 – 2 times higher than in the samples of peripheral blood taken from same patients. Separate LLI and separate use of ILIB cause marked reduction of the changes in organs and normalization of erythrocytes in blood. However, the most obvious normalization could be achieved by complex application of both LLI and ILIB. Among the variety of methods of irradiation of blood the most effective one is that, which has length of waves equal to 0.63 micron. LLI of foci of pathologic changes not only causes reduction of structural alterations but also normalizes the ration of discocytes and PFE. Complex LT, on the other hand, allows achieving even greater normalization of erythrocytes, reduction of intravascular microthrombi, which lead to normalization of microcirculation and to restoration of altered ultrastructures.

Application of LT in various pathologies leads to enhanced correction of specific changes due to restoration of normal discal shape of erythrocytes and therefore improvement of microcirculation, compromise of which is one of the essential pathogenetic mechanisms in many conditions. The most optimal method of LT, in our opinion, is combination of local irradiation of lesions with intravascular irradiation of peripheral blood.

1. Baybekov I., Mavlyan-Khodjaev R., Erstekis A. Moskvin S. Erythrocytes in norm, pathology and laser irradiation. Tver – "Triad". 2008. P. 255
2. Baybekov I.M., A. I. Ibragimov, S.M. Rizaeva, A.I. Baybekov. Application of laser therapy for reduction of changes in erythrocytes and cells of body in their pathology. Abstracts of Laser Helsinki 2010 Congress. 20-23 August. 25, p. 13.