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Glutathione reductase-glutathione peroxidase system in the blood of patients with non-Hodgkin lymphoma

Background: Processes of peroxide oxidation of lipids (POL) are enhanced and metabolism is disturbed in the patients with non-Hodgkin lymphoma (NHL). Glutathione and glutathione-dependent enzymes are responsible for the control of intracellular reduction-oxidation status through the antioxidant which was found in the promoters of many genes that are inducible by oxidative and chemical stress.

Aim: Comparative examination of the activity of glutathione reductase (GR), glutathione peroxidase (GP) and glucose-6-phosphate dehydrogenase (G6PD) in the peripheral blood of the patients with non-Hodgkin lymphoma (NHL) and healthy individuals.

Material & Methods: Fifty-seven patients aged 41-58 years (mean age 49.5 ± 8.5 years) were examined before treatment in comparison with 25 healthy individuals. The activity of GR, GP and G6PD were determined with spectrophotometry methods (Humalyzer 2000, DE) in the blood plasma, lymphocytes and erythrocytes in the NHL patients and healthy. Peripheral blood lymphocytes were obtained by A. Böyum method. The results of specific activities of the enzymes were analyzed with Student statistical method and Spearman correlation method.

Results: The activity of the enzymes suggested an imbalance of antioxidant defense system and metabolic disturbances in NHL patients. Close functional correlation between GR and G6PD persisted in the patients with prolymphocytic (PL) ($r = +0.595$; $p < 0.025$) and lymphoblastic (LB) ($r = +0.716$; $p < 0.0005$) variants of the disease. A correlation between the activity of antioxidant enzymes and the proliferative activity of blood cells was found in the patients with LB NHL.

Conclusion: The obtained results reflect the interrelation between activity of pathological process and an imbalance of the antioxidant enzymatic system, including GR, GP and G6PD, in the NHL patients, and may be used for differential diagnostics, screening and monitoring during treatment as an additional biochemical test.

Biography

Ludmila Gavriluc is a Professor of Biochemistry and Clinical Biochemistry at the Department of Nicolae Testemitanu State University of Medicine and Pharmacy, Chisinau, Moldova. She was graduated from State Medical University, Medico-Biological Department, Russia with specialty in Biochemistry and completed PhD in 1978 and MD in 1997 at the State Medical University, Moscow, Russia. She is the author of 97 scientific and methodic peer-reviewed manuscripts and 6 books. Her areas of scientific interests are clinical-diagnostics, oncology, hematology, stomatology and antioxidant therapy.

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