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Glutathione-Dependent Enzymes are Biomarkers of Inflammatory Process in Patients with Phlegmons of Maxillofacial Area

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Introduction: Inflammation-destructive process, accompanying phlegmons, in the patients leads to the disturbances of the metabolic processes and an imbalance of the antioxidant defense system. Increased free radical generation and lipid peroxidation has been considered to play an important role in the pathogenesis of phlegmons. Glutathione-associated metabolism is a major mechanism for cellular protection against agents which generate oxidative stress and peroxide oxidation of lipids (POL).

Purpose: Of our investigation was examination of the glutathione enzymatic redox-system, including reduced glutathione (GSH), glutathione reductase (GR), glutathione peroxidase (GP) and glutathione S-transferee (GST), in the blood plasma and leucocytes in the patients with phlegmons of the maxillofacial area during treatment with complex therapy (traditional & antioxidants).

Material and methods: Twenty one patients (19-46 years) and twenty healthy subjects were examined. Patients were treated with comprehensive therapy included antioxidant therapy (AOT), preparation "Aevitum" (35 mg retinol acetate and 100 mg α-tocopherol acetate) during 7 days. The activities of all enzymes and content of GSH and protein were determined in blood plasma and leucocytes using spectrophotometric methods (Humalyzer 2000, DE). The results were calculated with the statistical Student's method and Microstat: Microsoft Excel 2007 program. Spirmean's method of correlation was used for examination of interrelation between the parameters.

Results: Inflammation process led to the metabolic imbalance of glutathione-dependent enzymes and intoxication that reflected the increase of the GSH content and activity of GP and GST in the blood plasma and especially in leucocytes in the patients with phlegmons before treatment. Complex therapy, including AOT, decreased activity of glutathione-dependent enzymes and content of GSH already in a week. Correlation analysis indicated a positive interrelation before treatment only between GR and GST in the blood plasma and leucocytes. A strong positive correlation between all parameters was indicated after complex therapy.

Conclusion: In a week the complex therapy, including AOT, partially has been corrected imbalance of the glutathione-dependent enzymatic redox-system. This fact was confirmed by the dynamics of activity of the enzymes, the reduction of inflammation period and treatment course duration, and the more effective improvement of the patient's health status. Glutathione and glutathione-dependent enzymes may be biomarkers of the inflammation process in the patients with phlegmons of maxillofacial area, their activity may be the reflection of a degree of pathological process activity and use for its control during treatment (monitoring).

Key words: Glutathione reductase; glutathione peroxidase; glutathione S-transferase; phlegmons

Biography:

Ludmila Gavriliuc working as a Professor of Biochemistry and Clinical Biochemistry Department of Nicolae Testemitanu State University of Medicine & Pharmacy, Chisinau, Moldova. She graduated from the State Medical University, Medico-Biological Department, Specialty - Biochemistry, Moscow, Russia, and completed PhD (1978) and MD (1997) at the State Medical University, Moscow, Russia. She had the Scholarships in Russia, Italy, USA (01-08.2013, Fulbright Program U.S., Feist-Weiller Cancer Center, LSU HSC, and LA). She is author of 107 scientific and methodic peer-reviewed manuscripts and 6 books. Participation in Conferences: USA, GB, Spain, Romania, Russia. Areas of the scientific interests are clinical-diagnostics, oncology, hematology, dentistry, antioxidant therapy.