

INFLUENCE OF LOCAL BIOACTIVE COMPOUNDS ON SPLEEN LYSOSOMAL ENZYMES ACTIVITY IN ETHYLENE GLYCOL INTOXICATION

Mihalciuc Olga¹, Garbuz Olga², Pantea Valeriana¹, Bernic Valentin¹, Gulea Aurelian²

¹State University of Medicine and Pharmacy "Nicolae Testemitanu"

²State University of Moldova, Chisinau, Republic of Moldova

Background. The high prevalence of various diseases with a tendency to chronicity is caused by the difficulty of choosing optimal and safe methods of treatment and/or prevention, which is one of many problems of modern medicine. Several recent findings demonstrate the central role of the lysosome as crucial regulators of cell homeostasis and lysosomal dysfunction thus appears as a common hallmark in many pathological conditions [1]. In connection with this of particular interest are local bioactive compounds (BC) – Schiff bases, their combination with 3d metals, that exhibit important biologic activity [2,3]. Nevertheless, their influence on the functional state of cellular lysosomal apparatus in spleen in ethylene glycol (EG) intoxication was not studied.

The **aim** of the study was to elucidate the functional status of the lysosomal apparatus in ethylene glycol intoxication and to elucidate the influence of local bioactive compounds (BC) on spleen lysosomal enzyme activity.

Methods. Ethylene glycol was administered *per os*. The main spleen tissue lysosomal enzymes activity – cathepsins (Cat) B, D, G, H, leucyl aminopeptidase (LAP), acid phosphatase (AP), β -galactosidase (β -Gal), β -glucosidase (β -Glu), N-acetyl- β -D-glucosaminidase (NAG), arylsulfatases A, B and C, was determined by spectrophotometric micro method adapted to the Hybrid Multi-mode Microplate Rider Synergy H1, "BioTek" (USA). After ethylene glycol poisoning animals were treated with local BC: Schiff bases and their combination with 3d metals – CMD-4, CMD-8, CMJ-23, and the cyanobacterial remedy – BioR-Ge with enhanced content of organically bound Ge.

Results. Local BC administration in ethylene glycol intoxication exerted significant influence on the studied enzymes activity, manifested by the suppression of the Cat D and G, inhibition of LAP, NAG, β -Gal and AP. It is obvious that studied compound had selective action on lysosomal enzymes that depends on their degree of engagement at different stages of the disease process. CMD-4 inhibited Cat B, arylsulfatase A and B, LAP, NAG and β -gal, kept low the levels of Cat D and H, and induced the AP activity. CMD-8 inhibited elastase and Cat B, kept low the LAP and β -Gal activity, and induced the β -Glu and arylsulfatase C activity. CMJ-23 inhibited Cat H, kept low NAG and LAP activity, and increased AP.

Conclusions. The ability of studied BC to modulate the lysosomal acid hydrolases activity and to modify the functional status of spleen lysosomal apparatus in ethylene glycol intoxication was established. Further research in this area would enable the development of new effective and harmless treatment for immune system disorders, which will provide high curative and prophylactic effect, prevention and elimination of complications.

Bibliography.

1. Boya P. Lysosomal function and dysfunction: mechanism and disease. *Antioxidants&Redox signaling*, 2012; 17(5): 766-774.
2. Gulea A., et al. In vitro antileukemia, antibacterial and antifungal activities of some 3d metal complexes: Chemical synthesis and structure – activity relationships // *Journal of Enzyme Inhibition and Medicinal Chemistry*, 2008; V. 23. Nr.6, pp.806-818.
3. Roșu T., Gulea A., Nicolae A., Georgescu R. Complexes of 3dn Metal Ions with Thiosemicarbazones: Synthesis and Antimicrobial Activity // *Molecules* 2007, 12, p.782-796.