The effect of short-term exposure of esters of thiosulfoacid on the phospholipids spectrum of hepatocytes

Anna Nakonechna[1], Andriy Pylypets[1,2], Viktoriya Havryliak[1], Volodymyr Novikov[1], Vira Lubenets[1]

1. Department of Technology of Biologically Active Substances, Pharmacy and Biotechnology, Lviv Polytechnic National University, Ukraine, Lviv, St. Yura square, 3/4, E-mail: vlubenets@gmail.com

2. Laboratory of biochemistry of adaptation and ontogenesis of animals, Institute of Animal Biology NAAS, Ukraine, Lviv, V. Stus, 38, E-mail: pylyp-andriy@ukr.net

Abstract – Administration of esters of thiosulfoacid on the phospholipid profile of liver in rats were studied. It has been shown the significant effect of allyl and methyl esters of thiosulfoacids on the ratio of phospholipid fractions in hepatocytes that is accompanied by a change in structural and functional characteristics of membranes.

Keywords – esters of thiosulfoacids, phospholipids spectrum, hepatocytes, rats

Introduction

A series of esters of thiosulfoacid have been synthesized in the Department of Technology of Biologically Active Substances, Pharmacy and Biotechnology. Esters of thiosulfoacids are widely used in pharmacology, medicine, and agriculture. These compounds are characterized by a wide range of biological activity, which makes them promising substances for the development of effective therapeutic agents [1]. As fat-soluble compounds, they easily penetrate membranes inside the cell, realizing their biological effects. Therefore, the purpose of our work was to study the effect of short-term exposure of S-esters of thiosulfoacids on the phospholipid spectrum of the liver in the rat.

Results and discussion

The effect of allyl-4-aminobenzenethiosulfanilate, ethyl-4-aminobenzenethiosulfanilate, and methyl-4-aminobenzenethiosulfanilate were studied in experiment. Studies were carried out on Wistar rat male with body weight 190-210 g, which were injected intraperitoneally by oil solutions of esters at the dose of 300 mg/kg of body weight once a day for 3 days. Animals of the control group were given an appropriate dose of sterile oil. The total content of phospholipids and their spectrum in liver tissues were determined.

The short-term exposure of synthesized esters of thiosulfoacid at a dose of 300 mg / kg of body weight did not significantly affect the total content of phospholipids in the liver of rats, but led to changes in the ratio of their fractions. Allyl and methyl esters of thiosulfoacid have the greatest impact on the phospholipid profile of hepatocytes. After administration of allyl esters of thiosulfoacid, the asymmetry ratio of hepatocyte membranes decreased significantly compared to control animals, indicating an increase in the saturation of lipid bilayer and an increase in the viscosity of the membrane. In contrast to allylthiosulfanilate, methyl ester of thiosulfoacid positively influenced on the structural and functional characteristics of cell membranes, increasing their fluidity.

Conclusion

Redistribution of different fractions of phospholipids in liver tissue in response to the short-term exposure of synthesized esters of thiosulfoacid is the result of adaptive-compensatory reactions of the organism of rats and is associated with their participation in various physiological processes.

References

1. V.I. Lubenets, “Tiosulfonaty: syntez i vlastyvosti”, *Ukrainskii Khimicheskii Zhurnal*,. vol. 69, no 3, pp.109-117, 2003