

## STUDYING THE CHRONIC TOXICITY OF THE NEW DRUG "TIOCIN" IN PRECLINICAL PRACTICE

Boboyev Behzod Muminjon ugli

Free applicant of the Department of Clinical  
Pharmacology of the Tashkent Medical Academy

Allayeva Munira Jurakulovna

Professor, Head of the Department of Clinical  
Pharmacology, Tashkent Medical Academy

### Actuality

Dyslipidemia is a violation of lipoprotein metabolism, manifested by an increase in cholesterol, triglyceride levels. Dyslipidemia is a potential risk factor for further development of cardiovascular disease.

Lipoic acid and zinc sulfate may provide protection against damage caused by reactive oxygen species in conditions of increased oxidative stress caused by dyslipidemia. They meet all the criteria for ideal antioxidants, as they reduce the side effects of oxidative stress, have amphiphilic properties and do not cause serious side effects. However, results from clinical trials of single exogenous antioxidant supplementation are inconsistent. Several studies that used only one synthetic antioxidant did not report any beneficial effects. Therefore, the best antioxidant effect can be achieved when using more than one antioxidant, that is, they must be used in a combined form, showing synergy.

### Purpose of the study

The study of the specific activity and effectiveness of «Tiocin» on the indicators and the level of lipoproteins in the blood of laboratory animals. Based on the conducted studies, the effectiveness of the original drug called «Tiocin» e on the level of dyslipidemia will be evaluated.

### Materials and methods

An experiment to study the specific activity of «Tiocin» was carried out on male rats weighing 150–180 g, in which alimentary hyperlipidemia was reproduced by administering cholesterol (orally with a probe) at a dose of 0.3 g/kg in heated sunflower oil for 15 days [5]. White rats were divided into 5 groups of 6 animals each. The drug «Tiocin» was administered to animals intragastrically daily for 15 days in doses: 10 mg/kg, 35 mg/kg and 70 mg/kg once a day as follows: group 1 - intact - Purified water; group 2 - control - 0.3 g / kg cholesterol in 1 ml of sunflower oil; group 3 - «Tiocin» at a dose of 10 mg / kg + 0.3 g / kg cholesterol in 1 ml of sunflower oil; group 4 - «Tiocin» at a dose of 35 mg / kg + 0.3 g / kg cholesterol in 1 ml of

sunflower oil; Group 5 - «Tiocin» at a dose of 70 mg / kg + 0.3 g / kg cholesterol in 1 ml of sunflower oil.

Throughout the study, the animals were examined daily with an assessment of their condition: behavior, appetite, body weight, coat condition, activity.

On the 15th day, rats were slaughtered and the level of cholesterol and triglyceride in vitro in blood serum was determined using a standard set of reagents: cholesterol, triglyceride, LDL cholesterol, HDL cholesterol, (Human GmbH, Germany) on a biochemical analyzer MINDRAY No. BA-88, China. The state of the antioxidant system and the intensity of peroxidation were assessed by the level of blood catalase and malondialdehyde.

The data obtained were processed statistically using the STATISTICA 10 program.

### Research results

When studying the specific activity of «Tiocin», it was found that, in normal animals, the amount of cholesterol and triglycerides in the blood serum was  $1.22 \pm 0.06$  mol/l and  $0.62 \pm 0.07$  mol/l, and in rats with alimentary hypercholesterolemia in blood serum, the amount of cholesterol and triglyceride was  $1.9 \pm 0.1$  mol/l and  $1.15 \pm 0.04$  mol/l. Those. the amount of cholesterol in rats that received cholesterol at a dose of 0.3 g/kg for 15 days showed an increase in cholesterol by 1.5 times, and triglycerides by 1.8 times compared with intact animals. The amount of low-density and high-density cholesterol also changed, the amount of which increased by 52%, while the amount of high-density cholesterol did not change compared to the intact group. The introduction of the drug «Tiocin» at different doses gave different results, the most effective dose was 35 mg/kg.

In the blood serum of rats treated with the drug «Tiocin», a significant decrease in the amount of cholesterol by 30.6% and triglycerides by 45% was observed. The triglyceride reading for low density cholesterol was 38.1% higher than the control, respectively.

It should be noted that the drug «Tiocin» did not have a statistically significant effect on high-density cholesterol levels.

The results of the obtained studies on the effect of the drug on the antioxidant system of the blood of rats showed that in the serum of rats with alimentary hyperlipidemia, a decrease in the amount of catalase was observed by 11.8, and the amount of malondialdehyde (MDA) increased by 1.94 times. The introduction of the drug «Tiocin» in different doses showed that the most effective dose was 35 mg/kg. At the same time, an increase in catalase was observed, almost to the norm and amounted to a level of  $1.14 \pm 0.01$  mmol / l, and the amount of MDA was  $16.2 \pm 0.13$ , which is 19% less than the control.

## **Conclusion**

The new drug consists of a combination of zinc sulfate and lipoic acid ready to meet currently unmet clinical needs. Upcoming clinical trials will allow more precise recommendations to be made.

In the present study, the ability of lipoic acid to have a lipid-lowering effect in combination with zinc sulfate and to change blood lipid levels in atherosclerosis-induced animals was determined. According to the results of studies, the use of the drug «Tiocin» as a cofactor in oxidation-decarboxylation reactions has been shown.

## **Literature**

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