FEATURES OF PROTEIN METABOLISM DURING INFLAMMATION UNDER TERMS OF TRANSDERMAL INJECTION OF GINGER EXTRACT

L. V. EBERLE[1], A. A. KOBERNIK[1,2], I. A. KRAVCHENKO[1,2]

[1]Department of Pharmaceutical Chemistry,
I.I. Mechnikov Odessa National University, Ukraine;
[2]Department of Organic and Pharmaceutical Technology,
Odessa National Polytechnic University, Ukraine;
e-mail: lidaeberle@gmail.com

In recent years, interest in plant medicines, which have a mild physiological effect, minimal toxicity, non-addictive, absence of immunosuppression, the possibility of prolonged use, has increased. One of the medicinal plants used in traditional medicine for many years in the treatment of various diseases is the ginger root, which contains a number of physiologically active substances.

The aim of the research was to study the biochemical changes in blood samples during the carrageenan-induced inflammation applying treatment using the ointment based on ginger extract.

The study was conducted on 20 males of white rats (2 groups of 10 animals each: 1st group – control (without treatment), 2nd group – application of 0.025% ointment with ginger extract 24 hours after phlogogen inoculation). Inflammation was caused by sub-planar injection of 0.1 ml of 1% carrageenan to the plantar fasciitis of the hind limb of rats. Indicators of protein metabolism (total protein and protein fraction ratio) were performed prior to the study and on days 1, 3, 6 and 8 of the experiment. All animal studies complied with the rules of the European Convention for the Protection of Vertebrate Animals Used for Experimental and Other Scientific Purposes.

According to the results of the research, it was found that phlogogen injection in all groups of animals within 1 day resulted in almost 2-fold hypoproteinaemia in comparison with initial numbers and contributed to a change in the albumin-globulin ratio (hypoalbuminaemia) on average by 35% while the level of some globulins of the so-called "proteins of acute phase" increased 2 times compared with normal physiological parameters.

According to literary sources, hypoproteinaemia in the conditions of carrageenan inflammation is associated with the release of proteins from the vascular channel into the inflammatory foci and exudate accumulation, thereby hypoalbuminaemia caused by the increase of the interleukin-1 level and the activation of the immunological process leading to the increased immunoglobulin production. Application of an ointment based on ginger extract stimulated a gradual, significant increase in total protein, and on the 8th day of the experiment, the return of protein content and albumin-globulin ratio to background values was observed. Whereas the partial restoration of protein metabolism was observed only on the 14th day of the study in the control group.