

MORPHOFUNCTIONAL CHANGES IN ADRENAL GLANDS OF EXPERIMENTAL ANIMALS UNDER MIXED EFFECT OF PHYSICAL AND CHEMICAL FACTORS IN CONDITIONS OF COLD STRESS

*E. Litovchenko, Senior Laboratory Assistant of Department of Hygiene and Ecology No. 2
S. Potapov, Cand. of Med. Science, Assistant Professor of Pathological Anatomy Department
Kharkiv National Medical University*

Kharkiv, Ukraine

*Scientific Adviser: Doctor of Med. Science, Prof. I. Zavgorodnii
Department of Hygiene and Ecology No. 2*

Urgency. The problem of adaptation of the organism to negative environmental conditions remains extremely urgent in modern medicine. The mixed effect of chemical and physical factors should be recognized as a priority from the viewpoint of immensity of possible negative consequences. These combinations include simultaneous exposure to chemicals and electromagnetic radiation (EMR) under conditions of cold stress. The adrenal glands play an important part in the process of adaptation. Therefore, in hygienic evaluation of negative effects of exogenous factors it is important to take into account the state of the adrenal glands [1,2].

Purpose of the study. Study of the morphofunctional state of the adrenal glands in laboratory rats exposed to a mixed effect of a chemical substance and EMR under conditions of cold stress.

Materials and methods. Twenty mature white male rats served as the object of the study. The animals were divided into two groups. The first group of animals was exposed to a mixed effect of a chemical substance ("Trim" coolant, a dose of 5,000 mg/kg), EMR (frequency 70 kHz, voltage 600 V/m) and a positive low temperature $4\pm 2^{\circ}\text{C}$. The second group was control. The animals were exposed 5 times a week for 30 days. Histological procedures were performed according to the guidelines of histological technique and histochemistry. The experiment was carried out with observance of all norms and rules for caring and using experimental animals.

Results and discussion. The morphological study of the adrenal glands of the animals from the first group found out an uneven thinning of the glomerular layer, its dark acidophilic cells were located compactly, thereby indicating delipoidization of the cytoplasm and exhaustion of raw materials of steroidogenesis. The cells of the fascicular and reticular layers also had a low-volume cytoplasm. In the cerebral layer, its neuroendocrinocytes had a large-volume cytoplasm with large vacuoles. An increase in the blood filling of the medulla was revealed.

Conclusions. Delipoidization of the cytoplasm of cells in the cortical, fascicular and reticular layers of adrenal glands indicates a decrease in the function of the cortical layer that can serve as a morphological marker when the mechanisms of mixed effect of physical and chemical factors change under conditions of cold stress and regular patterns of the organism's response are specified.

Literature:

1. Бачинський Р.О., (2013), Закономірності формування токсичних ефектів при сполученій дії хімічних та фізичних чинників (на прикладі нітробензолу), Медицина сьогодні і завтра, № 3 (60), С. 17-21.

2. Дунаев В.Н. (2006), Гигиеническая оценка риска комплекса антропогенных факторов физической и химической природы для здоровья населения: автореф. дис. д-ра мед. наук: 14.00.07. Оренбург, 47 с.