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Effects of Pesticides on the Body

Islamov Shavkat Erjigitovich
DSc, Associate Professor, Samarkand state medical university, Samarkand, Uzbekistan

Makhmatmuradova Nargiza Negmatullaevna
PhD, Associate Professor, Samarkand state medical university, Samarkand, Uzbekistan

Karimov Nodirbek Bakhtiyorovich
Samarkand state medical university, Samarkand, Uzbekistan

Annotation: The article is devoted to the data of the analysis of the influence of pesticides, while the scope of their application is constantly expanding, but the selectivity of their action on target objects remains relative. There is information about the negative impact of pesticides on the body of animals and humans, their ability to induce the development of various diseases. Any compounds that change the functioning of the three-component metasystem will inevitably disrupt the reactivity of the entire organism as a whole and can cause a breakdown in adaptive capabilities.

Keywords: pesticides, impact, animal and human organism, diseases.

Introduction. Pesticides play an important role in the global agricultural economy. Currently, there is no alternative to chemical methods for controlling pests, pathogens and weeds. This is confirmed by the annually increasing pesticide market, which, according to forecasts of the consulting firm TechSci Research, will grow to $100 billion by 2025, which will be due to a reduction in crop areas (TechSci Research, 2018) with a trend towards further intensification of agricultural production. In addition, there is growing interest in finding new drugs among pesticides. For example, ivermectin demonstrates antiviral activity, including against COVID-19, which opens up new possibilities for its use, subject to a comprehensive study of its pharmacotoxicological properties (Zobov V.V., 2024; Bertuloso B.D., et al., 2015) [4,9].

The scope of pesticide application is constantly expanding, but the selectivity of their action on target objects remains relative. There is information about the negative impact of pesticides on the body of animals and humans, their ability to induce the development of various diseases. At the same time, the violation of the immunoregulatory function is of great importance, since the immune system, along with the nervous and endocrine systems, ensures the dynamic balance of processes occurring in the body (Goncharov N.V., et al., 2019) [3]. Attempts to separate these systems were largely a semantic problem. Any compounds that change the functioning of the three-component metasystem will inevitably disrupt the reactivity of the entire organism as a whole and can cause a breakdown in adaptive capabilities (Vdovina, N.V., 2024) [1].

The safety of using drugs with high biological activity is a global problem (Gerunov, T.V., 2015) [2]. In this regard, there is an increasing need to study the hepatotoxic properties of pesticides and develop methods for preventing adverse effects when they affect the body.

A large number of previously conducted studies are devoted to the study of the effectiveness of pesticides and the description of the positive effects associated with their introduction into practice. The entry of drugs into the market is ahead of the accumulation of data on their potential danger in the context of the synergistic action of a large number of factors and many variables. Most of the published works are devoted to the study of the effects of active substances of pesticide preparations. For this reason, an opinion is expressed about the advisability of studying formulations containing various auxiliary components (Kashkarov, D. N., 2024; Krishna, M., 2017) [5,11]. However, there is little information on the effect of therapeutic doses and recommended rates of pesticide consumption

on the immune reactivity of productive animals in industrial conditions. The feasibility of pharmacotherapeutic correction of the immunotoxic effects of drugs used for antiparasitic treatment of animals and disinsection of livestock buildings requires confirmation. Based on this, studying the immunotoxic effect of widely used pesticides in model experiments on laboratory animals and in production conditions is an urgent task and will contribute to obtaining new information on their toxic potential and the possibility of pharmacological immunocorrection acceptable for implementation in industrial production.

As part of the pharmacoepidemiological study, a scientific systematization of data from the State Register of Animal Medicines was carried out, with the establishment of priority groups of pesticide preparations used in industrial agriculture. Based on the systematized information, the classification of veterinary immunomodulators by origin was expanded and supplemented (Kostyuchenko L.N. et al., 2018) [6].

Model experiments on laboratory animals have shown that drugs used for disinsection and antiparasitic treatment of animals have allergenic properties, inhibit the phagocytic activity of peritoneal macrophages, and cause the development of delayed-type hypersensitivity. The severity of these changes depends on the chemical structure of the drugs and the methods of their use. The immunocorrective role of enterosorption has been experimentally substantiated. Differences in the effects of the immunomodulator Azoxivet when administered against the background of different pesticides have been shown. The effect of insectoacaricides and pharmacorrective agents on the neurobehavioral reactions of animals, the activity of the pro- and antioxidant systems of the liver, brain and organs of the immune system has been proven (Kuznetsov S.V., Goncharov N.V., 2019; Mitra S., et al., 2014) [7,12].

In production experiments, it was found that pesticides cause a change in the metabolic status of animals and a decrease in immune reactivity. The development of adaptive stress is evidenced by the established correlations of biochemical and immunological indicators, which disappear after 7-14 days after the use of pesticides. During the studies, new scientific data were obtained on the immunotoxicology of synthetic pyrethroids, neonicotinoids and avermectins, the most widely used in agriculture (Pyanova L. G., 2019: Goncharov N. V., et al., 2017) [8,10].

Conclusion. It has been established that the scope of pesticide application is constantly expanding, but the selectivity of their action on target objects remains relative. There is information about the negative impact of pesticides on the organism of animals and humans, their ability to induce the development of various diseases. Any compounds that change the functioning of the three-component metasystem will inevitably disrupt the reactivity of the entire organism as a whole and can cause a breakdown in adaptive capabilities.

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