

CELLULAR FACTORS OF IMMUNITY OF ANIMALS VACCINATED AGAINST CHRONIC EXPOSURE TO DICHLOROPROPAPHOS

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ABSTRACT

This article considers the results of studies of the state of cellular factors of immunity of animals vaccinated against the background of chronic exposure to dichloropropaphos. T- and B- lymphocyte populations as well as phagocytic neutrophil activity in the NST test were studied from cellular immunity factors. Based on the obtained results, it is concluded that chronic intoxication of animals with dichloropropaphosae, even in the dose at the level of MDU in foods, causes suppression of the functional state of immunocompetent cells, which is manifested by reduction of T and B lymphocytes and HST positive neutrophils of peripheral blood.

KEYWORDS: Pesticide, cellular immunity, lymphocytes, neutrophils, dichloropropaphos, E-rosette formation, EAC-rosette formation.

RESEARCH MATERIALS AND METHODS

As a pesticide, 50% of a dichloropropaphos emulsion concentrate manufactured by Bayer of Germany was used in experimental studies.

Experiments were performed on 17 lambs of Karakul rock of 4 months age. Maintenance and feeding of experimental animals was carried out in accordance with the standards adopted in vivaria UzNIVI.

Chronic intoxication was reproduced by daily oral administration into aqueous suspensions of the preparation via an esophageal flexible probe at multiples of 1/50 and 1/500 of LD 50.

Possible negative effect of dichloropropaphos on immunobiological reactivity of animal organism was evaluated on the basis of complex of indices including: determination of populations of E- and EAC-rosette-forming lymphocytes, according to methodical instructions of EES [1]; Phagocytic activity of neutrophils - in HST-test [4].

For immunization of animals, concentrated GOA vaccine UzNIVI against colibacteriosis and salmonella of young farm animals was used according to the developed instructions for its use.

RESULTS OF RESEARCHES

17 Karakul lambs of 4 months weighing 16-20 kg were used, which were divided into 6 groups. Cell immunity factors were studied in animals vaccinated against colibacteriosis against chronic exposure to dichloropropaphosae at doses of 1/50 and 1/500 of LD50. These pesticide concentrations were 20 and 2 mg/kg of feed, respectively [2,3,4]. According to D.S. Muratov et al. (1987), the minimum dosage of pesticide - 2 mg/kg of fodder corresponds to the maximum permissible level (MDU) of dichloropropaphos in fodders for adult Karakul sheep.

Vaccination of experimental lambs was carried out simultaneously with the onset of chronic exposure to pesticide and after daily administration to animals for 14 days.

The general toxic effect of dichloropropaphos on experimental lambs was evaluated on the basis of a complex of indices, among which the main activity of the enzyme system of blood acetylcholinesterase was. It has been established that daily introduction of dichloropropaphos lambs into the body in a dose of multiple of 10 MDU already on day 14 caused them to develop chronic intoxication. Prolonged daily exposure to dichloropropaphos at a dose of 1/500 LD50 for 1.5 months. (MDU) caused the test lambs to have a condition characteristic of starting a toxic process under the influence of said pesticide.

The colibacteriosis vaccine did not have a negative effect on the body of the test animals. A more detailed description of morphological and biochemical changes in the blood of these lambs is presented in earlier

published articles [6,7,8,9]. The results of the study of quantitative changes in the population composition of T- and B-lymphocytes of peripheral blood of test lambs are characterized by the following changes. Daily, within 14 days, administration to test lambs of the first group of 1/50 ЛД50 dichloropropaphos significantly reduced only the relative number of E-rosette lymphocytes by 16% ($P < 0.05$) compared to the control.

The dynamics of quantitative changes and functional state of immunocompetent cells and HST - positive neurofils of peripheral blood of test lambs of this group after immunization with colibacteriosis vaccine was characterized by the absence of significant disorders on the part of E-rosette cell population compared to control. At the same time, the relative and absolute content of EAC-derived lymphocytes decreased and the minimum number was detected 28 days after vaccination, which was 29 and 42% lower ($P < 0.05$) respectively than the level of EAC cells in peripheral blood of intact, vaccinated lambs (fifth group). A statistically significant 44% reduction in the percentage of formazanpositive neutrophils ($P < 0.05$) should be noted, but by the end of the experiments (in 1.5 months), this indicator of the first group of test lambs was not significantly different from the same control animals.

In peripheral blood of test lambs of the second group vaccinated simultaneously with the onset of chronic exposure to dichloropropaphosae at a dose of 1/50 ЛД50, after 14 days statistically significant reduction of relative and absolute content of EAS-rosette lymphocytes, respectively by 30% and by 2 times ($P < 0.05$), compared to control, was found.

A statistically significant 23% reduction ($P < 0.05$) in the relative and absolute T-lymphocyte content was observed on day 21 of the post-regulatory period. The relative number of B lymphocytes decreased by 29% ($P < 0.05$) and absolute by 53% ($P < 0.05$), compared to the level of these immunocompetent cells in the blood of intact, vaccinated lambs of the fifth group.

By the time of testing the protective properties of the colibacteriosis vaccine (in 1.5 months of experiments), there were no significant differences between the T- and B-lymphocyte content and the functional state of the HST-positive neutrophils in the blood of the test lambs of the second group compared to the control. The following is also the dynamics of changes in the content and functional state of immunocompetent cells after experimental infection of experimental lambs of the second group with daily escherichia culture at a dose of ЛД100 (15 billion/ml), which shows that with the exception of a short-term decrease in the relative T-lymphocyte content by 25% ($P < 0.05$) and the percentage of HCT-positive neutrophils by 24% ($P < 0.05$), other.

Therefore, chronic intoxication of animals with dichloropropaphos has a negative effect on the functional state of the immunocompetent cells of their peripheral blood. Most dichloropropaphos affect B lymphocyte populations.

In the test lambs of the third group, who were given dichloropropaphos daily at a dose of 1/500 ЛД50 14 days before vaccination, a statistically significant reduction of 26% ($P < 0.05$) in the relative number of T-lymphocytes was found by the time of immunization. The absolute number of these cells tended to decrease by 32% ($P < 0.1$). The tendency to decrease by 26% ($P < 0.1$) was also the relative number of EAC-rosetted peripheral blood lymphocytes of these animals.

14 days after vaccination of the lambs of the third group and subsequent introduction of the pesticide into their body at a dose of 1/500 ЛД50, there was a significant decrease of 18% ($P < 0.05$) in the relative content of B- lymphocytes and 28% ($P < 0.05$) in their absolute amount compared to the control. The functional state of formazanpositive neutrophils in test animals of the third group was 48% lower ($P < 0.05$) than in intact lambs of the fifth group.

28 days after vaccination, the relative and absolute content of B-lymphocytes in the peripheral blood of the test lambs of the third group was 30% and 46% ($P < 0.05$), respectively, less than these values of intact animals. However, at the time of testing the protective properties of the colibacteriosis vaccine, the T- and B- lymphocyte content as well as the percentage of HCT-positive neutrophils in the priferic blood of the test lambs of the third group were the same as in the control animals.

The dynamics of changes in the quantitative content and functional state of immunocompetent cells in the blood of lambs of the third group, subjected to infection with escherichies at the dose ЛД100 did not differ significantly from the similar control lambs.

In the study of quantitative changes in the population composition of T- and B- lymphocytes and the functional state of formazanpositive neutrophils of peripheral blood of test lambs of the fourth group (with simultaneous vaccination and chronic, for 1.5 months, exposure to dichloropropaphosae at a dose of 1/500 LD50), significant differences compared to intact, vaccinated animals, have not been established.

The same results were obtained by studying the dynamics of changes of immunocompetent blood cells of lambs of this group after experimental infection with Escherichia culture at the dose of 10¹⁰.

Consequently, pre-exposure of animals to dichloropropaphos even in doses at the level of its MDU in foods has a negative effect on the functional state of the immunocompetent

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