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ANTIPARASITE CHEMOTHERAPY – SUPRESSING FACTOR OF CELL IMMUNITY IN BOVINE

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Abstract: The aim of the accomplished researches was the evaluation of immunologic modifications in antiparasitary treated bovine. The laboratory parasitological studies emphasized in adult bovines a poliparasitism occurance of 82%. The substances eliminated by the parasites provoke the nonspecific stimulation of Ts lymphocytes (8,6%, P<0,05), thus inhibiting the clone proliferation of the immunocompetent cells involved in cell immune response. The antiparasitic treatment diminished the level of B, T and Th lymphocytes and the resulted after the degradation of parasitic elements toxins induced the quantitative increasing of nul (47%, P<0,001) and Ts lymphocytes (11 %, P<0,05). The antiparasitic chemotherapy, duet o its immunotoxic effect, aggravate the pathologic process and, finally, decrease the immunibiologic reactivity of the host organism.

INTRODUCTION

The immunosuppression of parasitic factor represent an antigen competition where the T lymphocytes became active and suppress the immunologic capacity of B lymphocytes that have the role to produce antibodies against helminth antigens [6].

The experimental chemotherapy with Fenbendasol in pigs affected by ascaridosis induces the decreasing of lymphocytes and eosinophils, the Ivermectin doesn't influence upon the T lymphocytes, but increases the number of B lymphocytes and the level of immune complexes that circulate in blood, while the Rintal doesn't produce any visible modifications at the level of immune system [5].

The dehelminthisation with Hexicol of the bovines infected by *F. hepatica* and *D. lanceolatum* provoke a significant decreasing of T and B lymphocyte quantity, of the level of specific antibodies, of the lysosomic activity of the bacteria and blood serum [3].

The antiparasitic therapy with Ivomec and Ursovermit of the lambs experimentally infected by hystilesia diminish the antibody titre, the bactericide activity of the serum complement, significantly decrease the number of active T and B lymphocytes. The most profound modifications were registered at the use of Ursovermit [4].

The purpose of the study was to evaluate the consequences of antiparasitic chemotherapy upon the cell immunity in bovines.

MATERIALS AND METHODS

The researches were accomplished on 30 cows (4-6 years old) of Holstein race, divided in three groups of 10 animals each. **I** group – uninfected. **II** group – infected with *S. papillosus, F. hepatica D. lanceatum, E. granulosus larvae, Eimeria bovis, E. zuernii, E. smithi* şi *E. ellipsoidalis*. **III** group – infected (*S. papillosus, F. hepatica D. lanceatum, E. granulosus larvae, Eimeria bovis, E. zuernii, E. smithi, E. ellipsoidalis)* and treated with Himcoccidum, Albendazolum 2,5%, and Enrofloxacinum 5%. I and II groups were control groups.

The coprological analyses were made according to the methods of *Popova*, *Baermann*, *Darling* and *successive washing* in the Parasitological and Helminthological laboratory of the

Institute of Zoology of A.S.M. The sample collecting was accomplished individually by 3 samples in different day periods. The infection level by *E. granulosus larvae* was determined serologically by the reaction for hemaglutination, where the positive reaction was considered in the case when the specific antibody titre against hydatidosis was higher than 1:320 [2].

Within the antiparasitary therapy were used: *Himcoccidum*, in dose of 1,5/10 kg of weight 5 days consecutively; *Albendazolum 2,5%,* administrate in dose of 20ml/50kg of weight two time. For microflora control, spoiled and inoculated by the parasitic elements, *Enrofloxacinum 5%* (injection) in dose of 1,0 ml/kg of weight 5 days consecutively.

The total leukocytes were determined in Goriaev camera using leukocyte formula in colored smear. B and T lymphocytes have the property to fix on the surface of cell membrane corpuscular structures of different types in rosette form. In the test of rosette forming mouse erythrocytes were used as corpuscles for B lymphocytes and sheep erythrocytes – for T lymphocytes. In fixed and colored smears the cell number capable to form rosettes was calculated. Null lymphocytes were calculated as difference between the sum of T and B lymphocytes from 100%.

The obtained during the researches data were processed statistically with the calculation of variation parameters, arithmetical mean (M), mean deviation (m). The statistic signification (P) between the mean values of the studied parameters in different groups was determined using the Student criteria.

REZULTS AND DISCUSSIONS

After the accomplished coprological analysis it was revealed that the extensity of invasion with *S. papillosus* constituted 46%, *E. granulosus larvae* – 58%, *F. hepatica* – 10%, *D. lanceatum* – 12%, *Eimeria spp*. – 76%. The associated parasitism was established in 82% of the cases.

The high level of infection by parasites in studied bovines prove that the poliparasitism phenomenon is omnipresent, even in the case of closed type keeping of the animals.

The accomplished immunologic researches reveal the fact that the associated parasitism (*S. papillosus, F. hepatica D. lanceatum, E. granulosus larvae, Eimeria bovis, E. zuernii, E. smithi, E. ellipsoidalis)* diminish the level of total lymphocytes by 16,8% ($P<0,01$), B - 8% ($P<0,001$), T - 30% ($P<0,05$), Th - 12,2 % ($P<0,01$) and the nonspecific stimulation of the Ts lymphocytes (8,6%, $P<0,05$) was induced by the substances eliminated by the parasitic forms, thus inhibiting the clone proliferation of classes and subclasses of immunocompetent cells involved in the cell immune response.

The immunotoxic action of parasite exo- and endotoxins morfofunctionally disturb the B and T lymphocytes. These factors contributed to the significant increasing of null lymphocyte level by 38% ($P<0,001$) on the account of B and T lymphocytes, which leads to the essential decreasing of cell immune response.

The B:T ratio decreased by 20%, T:B - 21%, B:O - 77%, T:O - 82%, Th:Ts - 66%, but increased the ratio O:B by 77%, O:T - 82% and Ts:Th by 75%.

These modifications confirm the phenomenon of inhibition B, T, Th lymphocytes and the stimulation of null and Ts lymphocytes by the parasitic antigens, therefore provoking an immunodeficiency in the host organism favourable for their development, but reducing at the same time the defensive capacity of the host organism against other infectious agents.

In infected bovines (*S. papillosus, F. hepatica D. lanceatum, E. granulosus larvae, Eimeria bovis, E. zuernii, E. smithi, E. ellipsoidalis)* treated with *Himcoccidum, Albendazolum 2,5%,* and *Enrofloxacinum 5%* the level of total lymphocytes decreases by 18,2% ($P<0,01$), B - 8% ($P<0,05$), T - 39,4% ($P<0,001$), Th - 10,2 % ($P<0,01$), but increases the level of null lymphocytes by 47% ($P<0,001$) and of Ts - 11 % ($P<0,05$). The ratio T:B decreases by 41%, B:O - 83%, T:O - 89%, Th:Ts - 70,8%, but increases the ratio B:T by 41%, O:B - 82%, O:T - 90% and Ts:Th by 71%.

The obtained results prove that the complex antiparasitic treatment (*Himcoccidum, Albendazolum 2,5%, Enrofloxacinum 5%*) have an immunosuppressive action, which aggravate the pathologic process and finally diminish the immunobiologically reactivity of the host organism.

CONCLUSIONS

- The poliparasitism incidence in adult bovines, was recorded in 82% of the cases.
- The parasitic antigens inhibit B, T, Th lymphocytes and stimulate Ts lymphocytes, thus provoking a state of immune deficit in the host organism, which is favourable for their development, but reducing at the same time the defensive capacity of the host organism against other infectious agents.
- Due to the immunologic effect the complex antiparasitic chemotherapy proved to diminish the level of B, T and Th lymphocytes and the toxins resulted after the degradation of parasitic elements induced the quantitative increasing of null and Ts lymphocytes.

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