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Liposomal Antihelmintics in Parasitology

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Abstract : More than one third of the population and animals are infected with parasitic helminths. It is especially difficult to cure the larval forms of parasites. The larvae of Hymenolepis nana invade the villi of the intestinal mucosa. Toxocara larvae can live in the liver, heart, lungs, brain, eyes, and pancreas. Commercial antiparasitic drugs cannot guarantee a 100% cure after a single course of treatment, because parasite larvae invade the villi of the intestinal mucosa and the anthelmintics do not reach and kill cestode larvae. The aim of this work was to conduct a study of liposomal antihelminthics on the laboratory animals under the certification received from the Committee on Bioethics and Deontology. It has been checked: 1) anthelmintic activity of the liposomal form of fenasal in experimental hymenolepidosis of white mice (larval stage - Hymenolepis nana). 2) anthelmintic activity of the liposomal form of albendazole in experimental toxocariasis of white mice (in the lungs at the stage of larval migration). Since some helminths cause hemolysis of erythrocytes as we used a mixture of polar lipids developed by us with antihemolytic activity to obtain liposomes Fenasal and albendazole were included in the liposome membrane in the ratio of anthelmintic: lipids 1:10. . The average size of liposomes was 180 nm, and the concentration of lipids in liposomes was 1%. The researches were carried out on white male mice who were infected with Hymenolepis Nana invasional eggs in a peroral way with a doze of 100 eggs per animal. On the 5th day after infection, a liposomal fenasal and commercial fenasal were administered orally for comparison. The animals were observed for 15 days. Before the introduction of liposomes and on the 3rd, 5th, 15th day after the administration of the drug, studies were carried out on the presence of helminths in the organs of animals. The liposomal fenasal, when administered orally, had an anthelmintic effect on Hymenolepis Nana cysticercoids at a dose of 25 mg/kg. The percentage of efficiency was 90.06, 91.36 96.85% on days 3, 5, 15, respectively. For comparison, the commercial activity was at a dose of 200 mg/ml, which is 8 times higher than the dose of liposomal fenasal. To evaluate the anthelmintic effect of the liposomal form of albendazole in experimental toxocariasis of white mice (toxascaris in the lungs at the stage of larval migration), studies were also carried out on white mice. The animals were infected with invasive eggs of Toxocara canis, orally, at a dose of 100 eggs per animal. On the 5th day after infection, the liposomal albendazole was administered orally. The efficacy of the study dosage form was determined by counting Larva mirgans larvae in the lungs. The results obtained showed that the liposomal albendazole had the greatest anthelmintic effect on Toxocara larvae at a dose of 2.0 mg/kg, which was 3.75 times less than the therapeutic one. At the same time, the percentage of efficiency was 93.75% on the 3rd day, and 98.66% on the 5th day.

Keywords : hymenolepis, Toxocara, larvae, liposomes
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