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The Efficacy of Ivermectin With Prolonged Action, On the Basis of Biodegradable Polymers, At Nematodes of Sheep.

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ABSTRACT

This article presents the results of determining the anthelminthic efficacy of a sustained-release ivermectin drug form based on biodegradable polymers. The drug showed a high anthelmintic effect and within 60 days prevented the infection of sheep with nematodes of the gastrointestinal tract in conditions of pasture maintenance.

Keywords: sheeps, nematodes, anthelmintics, efficiency.

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INTRODUCTION

It is known that a high degree of animal invasion by nematodes is a significant problem hampering the development of sheep breeding in many countries [1, 2].

Thus, in India, gastrointestinal endoparasites were found in sheep with an extent of up to 62.9%, Serbia - up to 74.56%, where Haemonchus, Oesophagostomum, Trichostrongylus, Nematodirus and Chabertia were predominant in the region, up to 93 in the North Caucasus region of Russia, 7% with prevalence of nematodes, bunostomiasis, gemnochiasis and ostertagyosis [3-5].

One of the important sources of increasing the productivity of animals is the prevention and control of parasitic diseases, which cause significant damage to livestock. The economic damage caused by helminthiases is determined not only by the death of animals, but also by a sharp decline in productivity, a delay in the growth and development of young animals, poor feed payment, a decrease in reproductive capacity, increased susceptibility to other diseases, clinical and pathological disorders of animal body systems [6, 7].

In the fight against helminthiases, the priority is the chemical method of protecting animals based on strict regulation of the use of chemical agents that ensure the high effectiveness of therapeutic and preventive measures in nematodes, protect the environment from contamination and the possibility of obtaining high quality animal products.

Of great interest are sustained release and sustained release dosage forms which have a number of advantages over conventional dosage forms. Long-acting drugs have a long-term maintenance of the concentration of the active substance in the blood at the therapeutic level without significant fluctuations, the incidence and intensity of side effects associated with changes in drug concentration in the blood are reduced [8, 9, 10].

All this predetermined the need to study the effectiveness of new agents of treatment and prevention of this disease.

Scientists of the biological faculty of Moscow State University, the Institute of Biochemistry. A.N. Bach and LLC «SIC Agrovetzashchita» developed a long-acting drug form of Ivermectin based on biodegradable polymers. In previous experiments, high therapeutic and prophylactic efficacy of medicinal forms for psoroptosis of sheep, and hypodermatosis in cattle have been established and its toxicological characteristics [11] have been determined.

MATERIAL AND METHODS

The production experience on the study of the antiparasitic efficacy of medicinal forms of a new antiparasitic drug of prolonged action was conducted on the basis of a sheep farm in the Stavropol Territory in June 2017. Under the experience, 120 lambs of the year 2017 of the Caucasian breed were spontaneously infected with nematodes, which were divided into 6 groups of 20 heads each. Lambs of the first group were injected once subcutaneously with the drug form of ivermectin in combination with the PLGA prolongator at a dose of 1 ml / 50 kg of live weight. Lambs of the second group were injected subcutaneously with the dosage form of eprinomectin in combination with the PC prolongator in a dose of 1 ml / 50 kg of live weight. Lambs of the third group were injected subcutaneously with the drug form of ivermectin in combination with the PLGA prolongator and xylitol orthosilicate in a dose of 1 ml / 50 kg of live weight. The lambs of the fourth group were injected with a single subcutaneous dosage form of eprinomectin in combination with the PLGA prolongator and xylitol orthosilicate at a dose of 1 ml / 50 kg of live weight. The animals of the 5th group were injected subcutaneously with the once-known drug Ivermectin (P02CF01) at a dose of 1 ml / 50 kg of live weight, and the lambs of the 6th group were not treated and served as controls.

The efficacy of the drugs was assessed as a "control test" based on the results of coprological studies using the Füllerborn method with a saturated solution of ammonium nitrate before the administration of the preparations and 20, 35 and 60 days after the use of anthelmintics [12].

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RESULTS AND DISCUSSION

Results of coprological studies of lambs after the introduction of prolonged series of Iverlong in a dose of 1ml / 50 kg of live weight are presented in the table.

Table - Efficacy of prolonged series of dosage forms for sheep nematodes (n=120)

Pharmaceutical form	Results of the study after __ days							
	before treatment		20		35		60	
	II	EI	II	EI	II	EI	II	EI
Ivermectin + PLGA	24,3	100	3,9	50	7,9	80	11,9	90
Eprinomectin + PC	26,1	100	3,1	40	33,4	50	36,7	60
Ivermectin +PLGA+ orthosilicate xylitol	22,7	100	0	0	0,2	10	1,6	10
Eprinomectin +PLGA+ orthosilicate xylitol	22,1	100	23,6	40	57,4	50	36,9	90
Ivermectin (P02CF01)	24,4	100	2,0	50	77,4	100	68,7	100
Control	21,5	100	27,1	100	67,3	100	78,3	100

Note: II is the intensity of the invasion (average number of eggs of nematodes in 3 drops of suspension), EI - the extent of invasion (the number of infected sheep in%)

According to the results of coprological studies it was found that the drug form of ivermectin in combination with the PLGA prolongator and xylitol orthosilicate in a dose of 1 ml / 50 kg of live weight showed a high anthelmintic efficacy (IE = 97.6%, EE = 90%). The use of anthelmintics as an auxiliary component of the PLGA xylitol xylitol prolongant on the 60th day after the administration of the drug provides better protection against re-invasion.

CONCLUSION

Thus, the use of the drug form of ivermectin in combination with the PLGA prolongator and xylitol orthosilicate at a dose of 1 ml / 50 kg of live weight provides high efficiency of the deworming of the sheep and effectively prevents infection of animals with gastrointestinal nematodes in conditions of pasture content for 60 days. Any deviations from the physiological norm in animals in the first days after the administration of drugs and in the subsequent we did not note.

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