

Testing on the Effectiveness and Biological Safety of New Granules Based on Oxyclozanide and Albendazole (Oxyclozal) in Mixed Invasion of Fascioliasis and Gastrointestinal Nematodes of Sheep

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Abstract. In different regions of the Russian Federation, fascioles and strongilatoses of the gastrointestinal tract of young of sheep in the form of mono- and mixtinvasions are widespread endoparasitoses and are associated from fluctuations in the extensive index (EI) of 37.6-100%. The goal is to study the quantitative occurrence in young of sheep and to test the effectiveness of the granules based on oxyclozanide and albendazole (Oxyclozal) in mixed invasion of trematodes and strongilatoses of the gastrointestinal tract. Studies have shown that *Fasciola* and intestinal strongilates of 14 species in young of sheep in the form of mono- and mixed invasions are widespread with EI - 27.5-64.3%. In young of sheep, mixtinvasion of fasciol and intestinal strongilatoses manifested itself with EI = 44.0% with an invasion (II) intensity, respectively, of $16,8 \pm 1,4$ and $390,8 \pm 16,2$ ind./head. In the group of young sheep infected with mixtinvasion of fasciol and intestinal strongilates, the granules based on oxyclozanide and albendazole (Oxyclozal) at a dose of 15 mg / kg body weight had EE and IE of 100%. On the 5th day after a single deworming of eggs, fascioles and larvae of intestinal strongilatoses were not detected in feces. A dosage of 15 mg / kg body weight of the granules Oxyclozal should be recognized as an effective therapeutic dose.

1 Introduction

On the territory of the Russian Federation, fascioliasis and intestinal nematodes are ubiquitous, but more in areas of sufficient and excessive moisture, in places with swampy and wet pastures, stagnant and slow-flowing water bodies with an extensive invasion of animals on farms up to 40-90%. In 74 subjects, mono- and mixed helminth infections of animals expanded their nosological range and occurred in sheep with an EI of 5.0-100%, which requires the development of new methods of treatment and prevention (1, 3.5, 7, 9, 11, 13, 15 and 18-26). In sheep populations of different ages, helminthiasis (fascioliasis

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and intestinal nematodes) have an epizootic manifestation with the formation of mixed invasions, which requires the immediate development of control and preventive measures (2, 4, 6, 8, 10, 12, 14, 16, 17 and 18-26). Research conducted by VIGIS scientists (Gorokhov V.V., 2002, 2012; Arkhipov I.A., 2003, 2014) for 2000-2015. from 16.2 to 80.0% (1, 5, 7.8, 11, 13, 14, 16, 17 and 18-26). In Russia, only in 2010, when 2.15 million heads of cattle were slaughtered, 472 thousand heads (21.95%) of them were affected in the liver only by fasciolias (4, 6, 9, 10, 12, 16, 17 - 26). Based on this, we set ourselves the goal of studying the spread of mixed invasion of fascioliasis and strongylatoses of the gastrointestinal tract in the North Caucasus region and finding effective means of combating them.

2 Research Methodology

The distribution of mono- and mixed invasions of fascioles and intestinal nematodes in sheep was determined in 2020-2022 of full method helminthological autopsy according to K.I. Scriabin. When slaughtered 25 heads young of sheep, carcasses, internal organs and tissues were examined with the detection of trematodes and nematodes. An experiment to test the anthelmintic activity of the new granules based on oxcyclozanide and albendazole (Oxyclosal) with mixed invasions of fasciol and intestinal nematodes of 14 species was performed on 20 rams for age 20-24 months. The experimental (n = 16) and control rams (n = 5) were divided into 3 groups. Group 1 of rams (n = 8) invaded with a mixed invasion of fascioles and intestinal nematodes received a granules Oxyclosal at a dose of 10 mg / kg body weight with compound feed, group 2 rams (n = 8) at a dose of 15 mg / kg body weight, once in a similar pattern. The 3rd group rams (n = 5) served as an invaded control; they did not receive closafen. After 3, 5, 7, 10, and 15 days of the experiment, after a single administration of a new granules based on oxcyclozanide and albendazole (Oxyclosal), the rams were subjected to coproscopy.

The results of experimental trials of granules Oxyclosal it a mixed invasion of fascioles and intestinal nematodes were statistically processed using the computer program Biometrics.

3 Results and Discussions

a) Distribution of mono- and mixed invasions of trematodes *Fasciola hepatica* and intestinal nematodes in of sheep

In our early studies, fascioles and intestinal nematodosis in sheep in the form of mono- and mixed invasions were widely among the most common invasions in the subjects of the North Caucasus Federal District: fascioles in adult sheep with EI from 12.5 to 28.0%, intestinal nematodosis in young animals with EI from 37.0 to 100%.

Under the conditions of these studies, monoinvasion of fascioles in sheep was recorded with EI = 24.0% and II = 19.4 ± 1.6 ind./head, and monoinvasion of intestinal nematodes, respectively, with EI -32.0% and AI - 432.6 ± 21 ,3 copies/head. According to the results of autopsy of the liver, small and large intestines of sheep, high values of EI were registered in mixed invasion of trematodes fasciol and intestinal nematodes with EI = 44.0% with IS of fascioli 16.8 ± 1.4 ind. /head and nematodes 26 species - 390.8 ± 16.2 ind./head (Table 1).

Table 1. Distribution of mono- and mixed invasions of Fascioles and intestinal nematodes young of sheep, n = 25

№	Mono- and mixed invasions young of sheep	Researched young of	Invazed young of sheep	EI, %	II, ekz./ind.
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		sheep			
1	Fasciolesis	-	6	24,0	19,4 ± 1,6
2	Intestinal nematodoses	-	8	32,0	432,6±21,3
3	Fasciolesis +intestinal nematodoses	-	11	44,0	<u>16,8±1,4</u> 390,8±16,2
4	Total investigated young of sheep	25	25	100	-

b) The effectiveness of the granules based on oxcyclozanide and albendazole (Oxyclosal) in case of mixtinvation of fasciolesis and intestinal nematodoses in young of sheep

The new granules based on oxcyclozanide and albendazole (Oxyclosal) per 1 g includes: Closantel 250 mg, albendazole 150 mg, copper chelate 50 mg, cobalt chloride 50 mg, dry ceolite - 500 mg. In the 1st experimental group of young of sheep (n = 8) infected with a mixed invasion of *Fasciola hepatica* and intestinal nematodes, by the group method, a new granules based on oxcyclozanide and albendazole (Oxyclosal) at a dose of 10 mg / kg body weight showed EE - 75.0% and IE - 93, 0% (table 2). In the 2nd group of young sheep (n = 8) infected with a mixed invasion of *Fasciola hepatica* and intestinal nematodes, granules based on oxcyclozanide and albendazole (Oxyclosal) at a dose of 15 mg / kg body weight had EE and IE of 100%. At the same time, on the 5th day of deworming of eggs of *Fasciola hepatica* and larvae of intestinal nematodes, no feces were detected (Table 2). This dosage of the new granules Oxyclosal should be recognized as an effective therapeutic dose (table 2).

The rams of group 3 (invasive control, n = 5) remained invasive by intestinal nematodes when 96,4±8,6-98,5±8,8 specimens were detected eggs and larvae in 10 g of feces.

Table 2. Efficacy of the new granules based on oxcyclozanide and albendazole (Oxyclosal) with associative invasions of fasciolesis and intestinal nematodoses young of sheep

Group	The number of infected young of sheep	The number of free from <i>Fasciola hepatica</i> and intestinal nematodes of young of sheep after treatment	EE, %	Number of eggs of <i>Fasciola hepatica</i> and intestinal nematodes young of sheep per 10 g feces, ekz.		IE, %
				Before therapy	After therapy	
1	8	6	75,0	96,3±8,5	6,7±0,5	93,0
2	8	8	100	94,7±8,2	-	100
3	5	0	0	98,5±8,8	96,4±8,6	0

Thus, the new granules based on oxcyclozanide and albendazole (Oxyclosal) at a dose of 15 mg / kg of body weight mixed with animal feed is highly effective in experiments and is recommended for the treatment and prevention of mixed invasion of *Fasciola hepatica* and intestinal nematodes of young of sheep. The results of the distribution of mono- and mixed invasion of *Fasciola hepatica* and intestinal nematodes of 14 species and the effectiveness of the granules Oxyclosal were obtained. At the same time, information on the epizootology of fasciolesis and intestinal nematodes of sheep and the need to develop new methods of treatment and prophylaxis of mixtinvasions are consistent with the opinion of many well-known authors (1-26).

4 Conclusions

Studies have shown that of mixed invasion of Fasciola and intestinal nematodes of young of sheep is widespread in the region North Caucasus. Associative invasion of fascioles + intestinal nematodes occurs with EI = 44.0% with a fasciol intensity of 16.8 ± 1.4 ; intestinal nematodes 390.8 ± 16.2 ind. / head. granules based on oxcyclozanide and albendazole (Oxyclosal) at a dose of 15 mg / kg body weight is highly effective in experiments and is recommended for the treatment and prevention of mixtinvasions and does not have side effects.

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