

Research Article



The Effectiveness of the New Complex Bactericidal-Anthelmintic Composition Azitroprazifen in Echinococcosis of Dogs Complicated of by Streptococcal Infection

KHASAN KHAMIDOVICH SHAKHBIEV^{1*}, SAIDKHAMZAT SAIDMAGOMEDOVICH ABUMUSLIMOV¹, LARISA. VAKHAEVNA TARAMOVA¹, ISLAM KHASANOVICH SHAKHBIEV¹, SVETLANA ALEKSANDROVNA SHEMYAKOVA²

¹Department of Physiology and Anatomy of Man and Animals, Veterinary Medicine and Zoo engineering, Federal State Budgetary Educational Institution of Higher Education "Chechen State University", Grozny, Russia;

²Department of Parasitology and Veterinary Sanitary Expertise, Moscow State Academy of Veterinary Medicine and Biotechnology named after K.I. Scriabin, Moscow, Russia.

Abstract | Echinococcosis complicated by streptococcosis, especially in of young dogs has an epizootic manifestation. The research results showed that the spread of echinococcosis complicated by streptococcosis depends on the age of the dogs. As you can see, this pathology occurs in puppies within 55.5%, of in one-year-old young animals - 30.0%, in adult males and females - 15.0% of the number cases, which indicates of the dominant prevalence of echinococcosis complicated of by streptococcosis among young dogs. The effectiveness of the new bactericidal-anthelmintic composition azitroprazifen at a dose of 20 mg / kg body weight with ground beef of in echinococcosis young of dogs complicated by streptococcosis was high in our experience. In all 100% of the experimental dogs, on the 7th day after treatment, there was a complete absence in feces of eggs of *E. granulosus* and bacteria of the genus *Streptococcus* and an improvement in the physiological state of the body. In the experiments, a new complex bactericidal-anthelmintic composition azitroprazifen, including of 1 g per praziquantel 250 mg, azithromycin 150 mg, fenbendazole 250 mg, copper chelate 100 mg, cobalt chloride 100 mg and zeolite 150 mg, at a dose of 20 mg / kg dog body weight which the is a biologically safe, effective therapeutic and prophylactic agent for echinococcosis of young of dogs complicated by streptococcosis. For the first time, results have been obtained confirming that the components of azitroprazifene (praziquantel, azithromycin, fenbendazole, copper chelate, cobalt chloride and zeolite) not only had an etiotropic and pathogenetic effect against causative agents of echinococcosis and streptococcosis, of but also of synergism in the interaction

Keywords | Dogs, Echinococcosis complicated by streptococcosis new bactericidal-anthelmintic composition azitroprazifen, Dose, Extensefficiency.

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***Correspondence** | Khasan Khamidovich Shakhbiev, Department of Physiology and Anatomy of Man and Animals, Veterinary Medicine and Zoo engineering, Federal State Budgetary Educational Institution of Higher Education "Chechen State University", Grozny, Russia; **Email:** shaxbiev_ix@mail.ru

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INTRODUCTION

Echinococcosis complicated by streptococcosis, especially in young dogs, has an epizootic manifestation

(Atalaev et al., 2010), (<https://parasitesandvectors.biomed-central.com/articles/10.1186/s13071-020-3947-0>, 2019), (Magomedov, 2015), (<https://biomedres.us/pdfs/BJSTR.MS.ID.002419.pdf>, 2019). When bacteria of the genus

Streptococcus enter the mucous membrane of the small intestine at the sites of attachment of echinococcus scolexes, they quickly penetrate into the blood, suppress phagocytosis and cause septicemia. Released exotoxins of bacteria of the genus Streptococcus destroy the vascular endothelium, increase their porosity, thereby causing abundant hemorrhages on the mucous membranes, including the intestines (Zalikhonov, 2018; Humphries, 2017; Eldarova, 2017), (biomedres.us/fulltexts/BJSTR.MS.ID.002419, 2019). Echinococcosis complicated by streptococcosis occurs in 24.6% of dogs with a lethality of 70-90% of the number of sick animals, which requires the development of new complex bactericidal anthelmintic drugs for treatment and prevention (Bittirov et al., 2019), (<https://biomedres.us/fulltexts/BJSTR.MS.ID.002419.php>, 2019) (Atalaev, 2009, 2010) (<https://www.atlantis-press.com/article/55909621.pdf>, 2021). A great contribution to the study of the epizootology of echinococcosis in dogs and wild predators in the North Caucasus was made by such authors as Uspensky A.V., Zalikhonov M.Ch.; Kabardiev S.Sh.; Bittirov A.M.; Gazimagomedov M.G., Zhuravlev A.S.; Atalaev M.M., Shikhalieva M.A., Atabieva Zh.A., Kolodiy I.V.; Shakhbiev XX.; Magomedov O.A.; Karpuschenko A.A.; Eldarova L.Kh., Begiev S.Zh., Bittirova A.A.; Begieva S.A.; Kumysheva Yu.A., Vologirov A.S.; Zakhokhov R.M.; Nakova L.V. and other authors in whose works an epizootological analysis is given to the formation of parasitic systems of zoonoses complicated by infectious diseases (Bittirov et al., 2019).

MATERIALS AND METHODS

The distribution of echinococcosis complicated by streptococcosis in dogs of different ages was determined by the complete helminthological autopsy method according to K.I. Scriabin and of generally of accepted in bacteriology certified methods by research of 20 corpses. An experiment to test the effectiveness of the new complex bactericidal-anthelmintic composition azithroprazifen in echinococcosis of dogs complicated by streptococcal infection was performed on 10 dogs, which were divided into 2 groups (of experimental, n = 7 and of control, n = 3). Dogs of the experimental group (n = 7) infected with Echinococcus granulosus and streptococcal infection received a new bactericidal-anthelmintic composition azithroprazifen at a dose of 20 mg / kg body weight with ground beef. Dogs of the 2nd group (n = 3) served as of infected control Echinococcus granulosus and streptococcal infection, they did not receive azithroprazifen. According to the experimental plan, 3, 5, 7, 10, and 15 days after a single administration of the new bactericidal-anthelmintic composition azithroprazifene, the excrement of all experimental and control dogs was subjected to coproscopy and bacteriological studies [3,5,6,9,11,13,148]...

The materials of experimental tests on dogs of azithroprazifene in echinococcosis complicated by streptococcal infection were subjected to statistical processing using the computer program "Biometry".

RESULTS AND DISCUSSION

Distribution of mono- and mixed invasions of echinococcosis and intestinal nematodes, complicated by streptococcosis in dogs in rural settlements in the North Caucasus region.

Echinococcosis of dogs in the form of monoinvasion, complicated by streptococcosis and in association with intestinal nematodes (toxocarasis and hookworm disease) in the North Caucasus region is a widespread pathology. Monoinvasion of echinococcosis complicated by streptococcosis occurs with EI 56.66%, mixed invasion of echinococcosis and toxocarasis in dogs with EI -26.67%, mixed invasion of echinococcosis and hookworm with EI -16.67% (Table 1). Monoinvasion of echinococcosis in dogs, complicated by streptococcosis, was also found in rural settlements with high values of invasion intensity (863 ± 75 specimens / head) (Table 1).

THE SPREAD OF ECHINOCOCCOSIS COMPLICATED BY STREPTOCOCCOSIS IN DOGS OF DIFFERENT AGES

The research results showed that the spread of echinococcosis complicated by streptococcosis depends on the age of the dogs (Table 1). As you can see, this pathology occurs in puppies within 55.5%, of in one-year-old young animals - 30.0%, in adult males and females - 15.0% of the number cases, which indicates of the dominant prevalence of echinococcosis complicated of by streptococcosis among young dogs (Table 1).

The effectiveness of the new complex bactericidal-anthelmintic composition azithroprazifen in echinococcosis of dogs complicated of by streptococcal infection

The effectiveness of the new bactericidal-anthelmintic composition azithroprazifen at a dose of 20 mg / kg body weight with ground beef of in echinococcosis young of dogs complicated by streptococcosis was high in our experience. In all 100% of the experimental dogs, on the 7th day after treatment, there was a complete absence in feces of eggs of E. granulosus and bacteria of the genus Streptococcus and an improvement in the physiological state of the body. In control infected with Echinococcus granulosus complicated of by streptococcosis, 92.6 ± 8.4 - 94.4 ± 8.6 ind. of eggs cestodes and a high level of colonization by streptococci. In the experiments, a new complex bactericidal-anthelmintic composition azithroprazifen, including of 1 g per praziquantel 250 mg, azithromycin 150 mg, fen

Table 1: Distribution of mono- and mixed invasions of zoonotic nematodes of dogs in rural settlements in the region of North Caucasus, n = 50 [1-17]

Indicators	Mono- and mixtinvasion dogs of zoonotic etiology			Total investigated dogs
	Monoinvasion echinococcosis	Mixtinvasion echinococcosis and toxocarosis	Mixtinvasion echinococcosis and ankylostomosis	
Number of dogs invazed examined	30			30
Including invasive individuals dogs	17	8	5	30
Extensiveness invasion (EI), %	56,66	26,67	16,67	100
Intensity invasion (II), ekz./ind.	863 75	<u>68956</u> <u>47743</u>	<u>52243</u> 39035	-

Table 2: The spread of echinococcosis complicated by streptococcosis in dogs of different ages, n = 20

№	Dogs age	Researcher dogs	Infected individuals dogs	EI, %
1	Puppies	-	11	55,0
2	One year old dogs	-	6	30,0
3	Adult males and females	-	3	15,0
4	Total investigated dogs	20	20	100

Table 3: The effectiveness of the new complex bactericidal-anthelmintic composition azitropazifen in echinococcosis of dogs complicated of by streptococcal infection

Group	The number of infected dogs	The number of free from echinococcosis and streptococcal of dogs after treatment	EE, %	Number of eggs E. granulosus of per 5 g feces and power of colonization by of streptococci, ekz.		IE, %
				Before therapy	After therapy	
1	7	7	100	89,37,5/---	-	100
2	3	0	0	92,68,4/+++	94,48,6/+++	0

Note; +++- high colonization of streptococci
 --- lack of colonization by streptococci

bendazole 250 mg, copper chelate 100 mg, cobalt chloride 100 mg and zeolite 150 mg, at a dose of 20 mg / kg dog body weight which the is a biologically safe, effective therapeutic and prophylactic agent for echinococcosis of young of dogs complicated by streptococcosis. The dosage of azitropazifene 20 mg / kg of body weight of dogs should be recognized as an effective therapeutic dose (Table 3).

As you can see, a of new of complex bactericidal-anthelmintic composition azitropazifen at a dose of 20 mg / kg body weight mixed with minced meat is of highly effective in echinococcosis of dogs complicated by streptococcosis in experiments and is recommended for use of with a therapeutic and prophylactic purpose.

For the first time, results have been obtained confirming that the components of azithropazifene (praziquantel, azithromycin, fenbendazole, copper chelate, cobalt chloride and zeolite) not only had an etiotropic and pathogenetic effect against causative agents of echinococcosis and streptococcosis, of but also of synergism in the interaction. New

epizootological data on dog echinococcosis complicated by streptococcosis on the effectiveness of azitropazifen at a dose of 20 mg / kg body weight require implementation in veterinary practice and are consistent with the opinion of many famous Russian scientists (Bittirov et al., 2019).

CONCLUSION

Echinococcosis of dogs, complicated by streptococcosis, is a common pathology in the region of the Russian Federation. In puppies of the dog, the cestode Echinococcus granulosus and bacteria of the genus Streptococcus dominate with a lesion in 55.0% of cases with a high level of organism colonization. Azitropazifene at a dose of 20 mg / kg of body weight, mixed with minced meat, is very effective in experiments, has 100% effectiveness against Echinococcus and streptococcus and is recommended by us for the treatment and prevention of echinococcosis in dogs complicated by streptococcosis.

The authors have declared that there are no conflicts of interest.

NOVELTY STATEMENT

The authors declare that the results obtained on the topic of the article were obtained empirically, and the reflected information is new for science in the field of parasitology.

AUTHORS CONTRIBUTION

All authors took part in the study of the effectiveness of the new complex bactericidal-anthelmintic composition Azitroprazifen in dogs with echinococcosis complicated by streptococcal infection, collected materials, analyzed the material, and participated in writing the manuscript. Collectively reviewed the manuscript. All authors read and approved the final version of the manuscript.

REFERENCES

- Atalaev MM, Aliev ShK (2009). Distribution of echinococcosis of different breeds of hunting dogs in Dagestan. *J. Vestnik KrasGAU*, 11 (38): 163-165.
- Atalaev MM, Aliev ShK (2010). Distribution of echinococcosis of different breeds of hunting dogs in Dagestan. *J. Vet. Pathol.*, 1 (32): 10-11.

- Bittirov AM, Zakhokhov RM, Vologirov AS, et. al. (2019). The Of Results The Test New Multidisperse Anthelmintic Composition Prazinox At With Mono-And Of Mixtinvasion Of Echinococcosis And Multiceptosis Dogs. *Indo American J. Pharmaceut. Sci. (IAJPS)*; 06(10); 13888 – 13892.
- Humphries D., Nguyen S, Kumar S, et. al. (2017). Effectiveness of Albendazole for Hookworm Varies Widely by Community and Correlates with Nutritional Factors: A Cross-Sectional Study of School-Age Children in Ghana. *American J. Trop. Med. Hyg.* 96(2): 347-354. <https://doi.org/10.4269/ajtmh.16-0682>,
- Eldarova LKh, Bittirov A.M., Bittirova A.A. et. al., (2015). Embryotropic properties of the new composition of fenbendazole and albendazole (Panaverm plus). *Russian Parasitolog. J.* 3. 86-88.
- Magomedov O.A., Bittirov A.M., Kabardiev S.Sh. et. al. (2015). The effectiveness of new compositions based on albendazole and fenbendazole in intestinal sheep nematodoses. *Theory and practice of combating parasitic diseases.* 16, 57-58,
- Zhuravlev A.S. (2009). Fauna of helminths of dogs of the Kabardino-Balkarian Republic and improvement of measures to wombat dangerous zoonoses: a dissertation for the degree of candidate of veterinary sciences. Stavropol State Agrarian University. 23
- Zalikhanov M.Ch, Bittirov, A.M., Begiev S.A. (2018). Modern biological threats and global regulation to ensure the biosafety of livestock products. Materials of the All-Russian scientific-practical conference with international participation. FSBI "Belgorod Federal Agricultural Research Center of the RAS. 245-253. <https://parasitesandvectors.biomedcentral.com/articles/10.1186/s13071-020-3947-0> (2019). <https://doi.org/10.26717/BJSTR.2019.13.002419>, <https://www.atlantispress.com/article/55909621.pdf>