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Research Article

The Effects of Nitroscanate on Ascarid and *Dipylidium caninum* Infections in Dogs

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Abstract: In this study, nitroscanate (Lopatol tablets, Novartis) was tested for its efficacy against *Toxocara canis*, *Toxascaris leonina* and *Dipylidium caninum* in naturally infected dogs.

Dogs that had mixed infections of cestodes and nematodes were divided into two groups: the treatment group (10 dogs) and the control group (5 dogs). Dogs in the treatment group were treated orally with a single dose of 1 tablet/10 kg of nitroscanate (50 mg/kg). After the treatment, fecal samples were examined 5 times at intervals of 2 days and it was recorded that nitroscanate removed *D. caninum* (4 dogs) and *T. leonina* (7 dogs) in all of the infected dogs and in seven of the eight dogs infected with *T. canis*.

Key Words: *Toxocara canis*, *Toxascaris leonina*, *Dipylidium caninum*, Nitroscanate, Dog

Köpeklerde Askarit ve *Dipylidium caninum* Enfeksiyonlarına Nitroscanate'ın Etkisi

Özet: Bu çalışmada, *Toxocara canis*, *Toxascaris leonina* ve *Dipylidium caninum* ile doğal enfekte köpeklerde nitroscanate (Lopatol tablets, Novartis)'ın etkisi araştırılmıştır.

Sestod ve nematod türleri ile enfekte olduğu belirlenen köpekler 1 sağaltım (10 köpek/grup) ve 1 kontrol (5 köpek/grup) grubu olarak ayrılmıştır. Sağaltım grubu köpeklere ağız yolu ile tek dozda 10 kg'a 1 tablet olacak şekilde nitroscanate (50 mg/kg) verilmiştir. Nitroscanate uygulamasından sonra 2 gün aralıklarla 5 kez yapılan dışkı muayene sonuçları değerlendirildiğinde, sağaltım grubunda *D. caninum* ve *T. leonina* ile enfekte köpeklerin tümünün, *T. canis* ile enfekte 8 köpeğin 7'sinin nitroscanate ile tedavi edildiği belirlenmiştir.

Anahtar Sözcükler: *Toxocara canis*, *Toxascaris leonina*, *Dipylidium caninum*, Nitroscanate, Köpek

Introduction

In urban areas the rise in popularity of dogs as pets has created problems of environmental contamination by helminth parasite eggs and larvae. In many places the human and pet population are usually present together. Fecal deposits are the main route for the spread of helminth infections among dogs and they can be a hazard for human health (1).

Most helminth parasites of dogs can cause zoonotic infections. About 2% of the apparently healthy human population in developed countries show immunological evidence of infection with *Toxocara canis* (1). Children with pica or geophagia are most at risk, but some cases also occur in adults (1,2).

Many efficient anthelmintic products are available for dogs, but effective treatment to combat both classes of parasite nematodes and cestodes generally requires the repeated administration of drugs. This requirement is often not implemented by careless owners and the infection may become subclinical and not eradicated by insufficient treatment (1). Recently a new anthelmintic compound, nitroscanate (4 – (4'- nitrophenoxy) phenyl isothiocyanate), given as a single dose of 50 mg/kg has proved to be very effective against nematodes (*Toxocara canis*, *Toxascaris leonina*, *Ancylostoma caninum* and *Uncinaria stenocephala*) and cestodes (*Taenia pisiformis, Taenia hydatigena* and *Dipylidium caninum*) in dogs (1, 3-6).

The distribution of ascarids and tapeworms in dogs is widespread in Turkey (7). Various anthelmintics on the Turkish market show different actions against different nematodes and tapeworms in dogs. Therefore the purpose of this study was to evaluate the efficacy of nitrocanate (Lopatol tablets, Novartis), which is a new anthelmintic compound in Turkey, against naturally acquired *T. canis*, *T. leonina* and *D. caninum*.

Materials and Methods

This study was carried out in the dogs at Ankara Zoo. The dogs were divided into two groups: the treatment (10 dogs) and control (5 dogs) groups. The dogs were pure breeds (8 females and 7 males) including German shepherd, Kangal and pointer breeds. Following the collection of fecal samples from dogs, natural infections of *Toxocara canis*, *Toxascaris leonina* and *Dipylidium caninum* were identified by the technique of $ZnCl_2$ + NaCl centrifugal flotation of feces and by direct visual (macroscopic) examination of fecal samples for tapeworm proglottids; also each dog's perianal area was examined for proglottids. Twelve dogs were infected with *T. canis*, 9 were infected with *T. leonina* (3 of them were infected with both nematodes) and 6 dogs were infected with *D. caninum* (3 of them were infected with *T. canis*, T. leonina and *D. caninum*; 3 of them were infected with *T. canis* and *D. caninum*). The dogs were kept in separate cages during the trial.

Food was withheld from the dogs overnight. The drug was given to the dogs as follows: after opening the mouth, the nitroscanate tablets were placed at the back of the mouth, pushed down the esophagus by the researcher's finger, the mouth was closed and the throat was stroked until the dog swallowed. The nitroscanate tablets (Lopatol tablets, Novartis) were given orally in a single dose of 1 tablet per 10 kg body weight (50 mg/kg) with 1/4 of a tablet, as the smallest divisible portion, for body weights under 2.5 kg. The dogs were monitored for abnormal behavior, vomiting or diarrhea following treatment.

After the treatment, fecal samples were collected and examined 5 times at intervals of 2 days. The results were compared and the efficacy of nitroscanate was evaluated.

Results

Before and after the treatment, the fecal samples were examined by the technique of $ZnCl_2$ + NaCl centrifugal flotation for nematode infections and by direct visual examination of fecal specimens for tapeworm proglottids. The results of the examinations are presented in the Table. Oral administration of Lopatol tablets (Novartis) containing nitroscanate at a rate of 1 tablet per 10 kg body weight (50 mg/kg) removed *D. caninum* (4 dogs) and *T. leonina* (7 dogs) from all of the

Table. The effect of nitroscanate on *T. canis*, *T. leonina* and *D. caninum*.

Groups	Dog No	Gender	Helminth Species					
			Before treatment	Days after treatment				
				2	4	6	8	10
	1	F	*T. canis*, *T. leonina*, *D. caninum*	-	-	-	-	-
	2	M	*T. canis*, *T. leonina*, *D. caninum*	-	-	-	-	-
	3	F	*T. canis*, *T. leonina*, *D. caninum*	-	-	-	-	-
	4	M	*T. canis*, *D. caninum*	-	-	-	-	-
	5	M	*T. canis*, *T. leonina*	-	-	-	-	-
Nitroscanate	6	F	*T. canis*, *T. leonina*	-	-	-	-	-
(50 mg/kg)	7	F	*T. canis*	-	-	-	-	-
	8	F	*T. canis*	+	+	+	+	+
	9	M	*T. leonina*	-	-	-	-	-
	10	F	*T. leonina*	-	-	-	-	-
	11	M	*T. canis*, *T. leonina*	+	+	+	+	+
	12	F	*T. canis*, *D. caninum*	+	+, -	+	+	+
Control	13	M	*T. canis*, *D. caninum*	+	+, -	+	+, -	+
	14	M	*T. canis*	+	+	+	+	+
	15	F	*T. leonina*	+	+	+	+	+

infected dogs and seven of the eight dogs infected with *T. canis*. No toxic side effects were observed in animals during the trial at this dose of nitroscanate.

Discussion

In previous studies (1, 3-6), it was determined that nitroscanate in its micronized form and at a single dose of 50-56 mg/kg body weight, was highly effective (96.4-100%) in the treatment of dogs infected with *T. canis*, *T. leonina*, Ancylostoma caninum, Uncinaria stenocephala, *D. caninum*, Taenia pisiformis and T.hydatigena. Gemmel et al. (8) reported that a new anthelmintic compound, nitroscanate, given in micronized form (nominal particle size 2-3 µm) is more effective than nitroscanate powder (nominal particle size 10-20 µm) against nematodes and cestodes infections in dogs. In this study, treatment with nitroscanate (nominal particle size 2-3 µm) with 50 mg/kg removed *D. caninum* (4 dogs) and *T. leonina* (7 dogs) in all of the infected dogs and seven of the eight dogs infected with *T. canis*. When the results of this study are compared to the results of other studies conducted on nitroscanate (1,3-6,8), sharp similarities can be seen.

Gemmel and Oudemans (9) reported that a single treatment of nitroscanate at a dose of 1000 mg/kg or two treatments at 250 mg/kg eliminated Echinococcus granulosus completely. In the same study (8), it was recorded that vomiting and/or diarrhoea were observed at and above 62.5 mg/kg doses of the drug. These sequelae did not appear to affect the efficacy of the drug in removing worms. At and above 125 mg/kg, about 10% of the dogs developed some incoordination. This started about 24 h after treatment and lasted for up to 72 h. In extreme cases, dogs appeared to be heavily tranquilized and rested unless disturbed, but there was no loss of appetite. In this study, no toxic side effects were observed in animals during the trial on a 50 mg/kg dose of nitroscanate.

The results of the present study have shown that nitroscanate was highly effective and it is a drug of choice against either ascarids or *D. caninum* infections as a single dose of 50 mg/kg in dogs.

References

1. Genchi, C., Traldi, G., Manfredi, M.T.: Field trials of the anthelmintic efficacy of nitroscanate and mebendazole in dogs. Vet. Rec., 1990, 126, 77-80.
2. Steele, J.H.: CRC Handbook Series In Zoonoses. Section C: Parasitic Zoonoses. Vol: 2 CRC Press, Inc Boca Raton, Florida, 1982.
3. Bowman, D.D., Lin, D.S., Johnson, R.C., Lynn, R.C., Hepler, D.I., Stansfield, D.G.: Effects of nitroscanate on adult Taenia pisiformis in dogs with experimentally induced infections. Am. J. Vet. Res., 1991, 52, 1542-44.
4. Gemmel, M.A.: The effect of nitroscanate tablets on Echinococcus granulosus and Taenia hydatigena infections in dogs. Research in Veterinary Science, 1979, 27, 255-257.
5. Richards, R.J. And Somerville, J.M.: Field trials with nitroscanate against cestodes and nematodes in dogs. Vet. Rec., 1980, 106, 332-335.
6. Craig, T.M., Mercer, S.H., Wade, C.G., Lynn, R.C.: Efficacy of nitroscanate against naturally acquired infection with Ancylostoma caninum, *Dipylidium caninum* and Trichuris vulpis in dogs. Am. J. Vet. Res., 1991, 52, 1574-75.
7. Doğanay, A.: Türkiye'de kedi ve köpeklerde görülen parazitler. Ankara Üniv. Vet. Fak. Derg., 1992, 39, 336-348.
8. Gemmel, M.A., Johnstone, P.D., Oudemans, G.: The effect of micronised nitroscanate on Echinococcus granulosus and Taenia hydatigena infections in dogs. Research in Veterinary Science, 1977, 22, 391-392.
9. Gemmel, M.A. and Oudemans, G.: The effect of nitroscanate on Echinococcus granulosus and Taenia hydatigena infections in dogs. Research in Veterinary Science, 1975, 19, 217-219.