A comparative research on efficacy of Fenbendazole in the treatment of ascarids and hookworms of dog

A.M. LEFKADITIS

Veterinary Clinic, Thessaloniki, Greece, e-mail: mleuka@otenet.gr

SUMMARY. Nowadays there are a big number of effective drugs against intestinal nematodes parasites. Fenbendazole is a member of benzimidazoles that enjoys wide usage in dogs. Fenbendazole at a dose level of 50 mg/kg given to dogs for three continued days for the elimination of Ascarids (Toxocara canis, Uncinaria stenocephala), is very effective and achieves to reduce the mean fecal egg count after treatment nearly 100%.

Key words: anthelmitic, drugs, nematodes, parasites, dog

Introduction

This research took place in the period of time from 1 October 1999 to 30 September 2003 and occur in 21 dogs with Ascarids infestation and 19 dogs with Hookworms infestation.

The anthelmitic drug, which has used for the treatment of the above parasites, is a member of benzimidazoles with the chemical structure, methyl 5 (phenylthion)-2-benzimidazolecarbamate. Absorbed Fenbendazole is metabolized to at last two active metabolites, oxfendazole sulfoxide and oxfendazole sulfone.

Fenbendazole bind to tubulin molecules, which inhibits the formation of microtubules and disrupts cell division. Also can inhibit fumarate reductase, which blocks mitochondrial function and kills the parasites by depriving it of energy. Its use is safe in pregnancy, and does not have embryotoxic or teratogenic effects. The LD50 for rats and mice is higher than 10 mg/kg. In a study of 6 months toxicity in dogs, no effect was observed at 4mg/kg or less. At usual doses, generally does not cause any adverse effect. Hypersensitivity reactions secondary to antigen release from dying parasites may occur. Particularly at higher doses vomiting infrequently occur in dogs. There are two species of ascarids in Greece, Toxocara canis and Toxascaris leonina, and also there are two species of hookworm, Uncinaria stenocephala and Ancylostoma caninum. Toxocara canis eggs, when they are at the one-cell stage measure about 70 µm x 90 µm, and they are yellowish-brown and have a thick external protein coat, their shape is spherical and their contents homogeneous. Toxascaris leonina eggs can be readily identified from Toxocara canis eggs on the basis of their smooth outline. The zygote does not fill the egg, the egg, measuring 80 x 67 µm, contains a single cell when passed in the feces. Uncinaria stenocephala eggs measure 75 µm long by 45 µm wide. They are oval with dissimilar bluntly rounded poles and thin smooth cells. The eggs, which contain large blastomeres, resemble those of Ancylostoma caninum but are slightly larger.

Material and methods

In order to evaluate the efficacy of Fenbendazole when used in the treatment of Ascarids infection, 21 naturally infected dogs were used. Of these, 10 dogs were male and 11 were female. Out of the total, 15 were crossbred and 6 were purebred, of various breeds. Their ages ranged from 8 weeks to 4 years (18 under 6 months of age and 3 over 6 months of age).

In order to evaluate the efficacy of Fenbendazole when used in the treatment of Hookworms infection, 19 naturally infected dogs were used. Of these, 9 dogs were male and 10 were female.
Out of the total, 16 were crossbred and 3 were purebred, of various breeds. Their ages ranged from 6 weeks to 10 years (12 under 6 months of age and 7 over 6 months of age).

All fecal egg counts were converted to eggs per gram (g) of feces before data analysis. The examination method of all samples was executed in a diagnostic system Fecalyzer (Fecal Examination of EVSCO PHARMACEUTICALS, USA) by means of the technique of flotation. According to this method, a diagnostic system is used for a feces sample, 1 cm³ feces is collected using the interior device of the system, which is placed it in the bigger exterior one. The flotation solution (Fecasol: Stable solution of sodium nitrate, with stable special gravity 1.2) is poured. Then the interior device is rotated in order to mix the sample with the flotation solution and to separate the eggs of the parasites from the rest feces mass. Next the solution is added in order to form a meniscus. We place a tent on its surface. The eggs will float while the feces remain on the bottom part of the pot. After 15-20 min., the tent is placed in a carrying plate and is examined under the microscope.

In the study, geometric mean fecal egg was used to estimate percentage reduction in fecal egg counts after treatment.

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\text{Geometric mean count (pretreatment)} - \text{ geometric mean count (fenbendazole)} \times 100 = \% \text{ reduction}
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\frac{\text{Geometric mean count (pretreatment)}}{\text{Geometric mean count (pretreatment)}} \times 100 = \% \text{ reduction}
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**Results and discussions**

**Ascarids:** Pretreatment means fecal egg count: 276.79/g of feces.

Mean fecal egg count 7 days after the day 1 of treatment with Fenbendazole: 0.73 eggs/g of feces. Percentage egg reduction 7 days after the day 1 of treatment: 99.74%.

**Hookworms:** Pretreatment means fecal egg count: 18.1/g of feces.

Mean fecal egg count 7 days after the day 1 of treatment with Fenbendazole: 0.01 eggs/g of feces. Percentage egg reduction 7 days after the day 1 of treatment: 99.94%.

Fenbendazole is a member of benzimidazoles that enjoys wide usage in dogs. Fenbendazole granules at a dose level of 50mg/kg is mixed in the feed and given to dogs for three continued days for the elimination of *Toxocara canis*, *Toxascaris leonina*, *Ancylostoma caninum*, *Uncinaria stenocephala* is very effective (Bowman 1992, Burce and Roberson 1978, Roberson and Burce 1982, Roberson and Cornelius 1983).

According to the results of this research, Fenbendazole achieves to reduce the mean fecal egg count of Ascarids at a very high percentage, estimated at 99.74%. The effectiveness of Fenbendazole against Hookworms is estimated at the percentage of 99.94% at a dose of 50 mg/kg per day for three continued days (P.O.). Generally the advantage of Fenbendazole is the high percentage of effectiveness, nearly 100% for ascarids and hookworms and the wide spectrum of activity.

**Bibliography**