Estimation of Gastrointestinal Helminth Parasites in Hunting Dogs from the Area of Foothills of Olympus Mountain, Northern Greece

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Abstract. The prevalence of gastrointestinal helminth parasites in hunting dogs from the area of foothills of Olympus Mountain was investigated through fecal examination, using a sedimentation method. From a total of 317 fecal samples collected, the following parasites were identified: Toxocara canis (10.4%), Ancylostomidae (9.8%), Dipylidium caninum (8.8%), Trichuris vulpis (4.7%), Taeniidae (1.9%), Toxascaris leonina (1.3%), Spirocercus lupi (0.6%) and Alaria alata (0.6%).

This study has recorded, with respect to the age of the infected dogs, a significantly higher prevalence in young dogs infected with Toxocara canis, compared to adults, and a significantly higher prevalence in adults of the Trichuris vulpis and Dipylidium caninum infection (p<0.05). As regards gender, a significantly higher prevalence was recorded in female rather than male dogs infected with the nematode Toxocara canis (p<0.05)

Key words: Prevalence, gastrointestinal, parasites, dog, hunting

INTRODUCTION

A variety of parasites live in the gastrointestinal tract of dogs. Some of the infected animals are asymptomatic, while others show mild or more severe clinical signs, like diarrhoea, emesis, unthriftness, anaemia and others (Taylor et al, 2007)

Dogs eliminate their gastrointestinal parasite dispersion elements by the faecal route. The quantity of canine faeces deposited on public or private property in cities or in rural areas worldwide are both a perential nuisance and an important health issue (Matter and Daniels, 2000). It must be pointed out that some of the intestinal parasites, such as Toxocara canis, Ancylostoma spp, Echinococcus garnulosus, can potentially infect humans and cause serious public-health concerns worldwide (Schantz, 1994, Rubel et al, 2005, Taylor et al, 2007). Fields, rural areas, public sites, such as playgrounds, parks, gardens, public squares and sandpits may be an important source of human infection (Habluetzel et al, 2003, Sànchez et al, 2003, Rubel et al, 2005). Many intestinal parasites only occur in dogs, but it is a known fact that others, like Taenia spp, produce significantly health problems for other animals also, during their larva stage (Urquhart et al, 1996, Taylor et al, 2007).

The aim of this study is to investigate the prevalence of gastrointestinal helminth parasites with respect to the age and gender of the infected hunting dogs in this area for first time, in relation to the fact that such parasites can cause serious diseases to the infected animals, some of which may also affect humans.
MATERIALS AND METHODS

The prevalence of digestive helminth parasites in hunting dogs aged between 1 month and 15 years. Those were examined and measured through an examination of their fecal samples. The study was carried out between November 2007 and November 2008. A total of 317 fecal samples were collected, belonging to 128 male and 189 female dogs, of which 105 were young and 212 were adult dogs.

The parasitological fecal examination was carried out mainly by a sedimentation method, namely Telemann’s technique, using HCL and Ether. The obtained results were statistically analysed by using the Chi-square test with a significance level of p<0.05.

RESULTS

Out of the 317 canine fecal samples, the overall prevalence of parasitism was 25.2% and 8 species were identified. Infection with only one endoparasitic species was observed in 54 (67.5%) of infected dogs, two in 16 (20%), three and four in 5 (6.3%) dogs. The following parasites were identified in the infected dogs: Class Nematodea: Toxocara canis: 33 (10.4%), Toxascaris leonina: 4 (1.3%), Ancylostomatidae: 31 (9.8%), Trichuris vulpis: 15 (4.7%), Spirocercus lupi: 2 (0.6%), Class Cestodea: Dipylidium caninum: 28 (8.8%), Taeniidae: 6 (1.9%), Class Trematode: Alaria alata: 2 (0.6%). (Table 1)

Table 1. Number and prevalence of gastrointestinal helminth parasites with regard to gender and age

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Male n=128</th>
<th>Female n=189</th>
<th>Young n=105</th>
<th>Adult n=212</th>
<th>Total n=317</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxocara canis</td>
<td>9 (7.0%)</td>
<td>24 (12.7%)</td>
<td>24 (22.8%)</td>
<td>9 (4.2%)</td>
<td>33 (10.4%)</td>
</tr>
<tr>
<td>Ancylostomatidae</td>
<td>14 (10.9%)</td>
<td>17 (6.7%)</td>
<td>10 (9.0%)</td>
<td>21 (9.9%)</td>
<td>31 (9.8%)</td>
</tr>
<tr>
<td>Dipylidium caninum</td>
<td>12 (9.4%)</td>
<td>16 (8.5%)</td>
<td>6 (1.9%)</td>
<td>22 (10.4%)</td>
<td>28 (8.8%)</td>
</tr>
<tr>
<td>Trichuris vulpis</td>
<td>6 (4.7%)</td>
<td>9 (4.8%)</td>
<td>0 (0.0%)</td>
<td>15 (7.1%)</td>
<td>15 (4.7%)</td>
</tr>
<tr>
<td>Taeniidae</td>
<td>2 (1.6%)</td>
<td>4 (2.1%)</td>
<td>0 (0.0%)</td>
<td>6 (2.8%)</td>
<td>6 (1.9%)</td>
</tr>
<tr>
<td>Toxascaris leonina</td>
<td>2 (1.6%)</td>
<td>2 (1.1%)</td>
<td>1 (1.0%)</td>
<td>3 (1.4%)</td>
<td>4 (1.3%)</td>
</tr>
<tr>
<td>Spirocercus lupi</td>
<td>1 (0.8%)</td>
<td>1 (0.5%)</td>
<td>0 (0.0%)</td>
<td>2 (0.9%)</td>
<td>2 (0.6%)</td>
</tr>
<tr>
<td>Alaria alata</td>
<td>2 (1.6%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>2 (0.9%)</td>
<td>2 (0.6%)</td>
</tr>
</tbody>
</table>

With respect to the age of the infected dogs, a significantly higher prevalence was recorded in young dogs rather than in adults that were infected with Toxocara canis, furthermore, a significantly higher prevalence was found in adults with Trichuris vulpis and Dipylidium caninum infection (p<0.05). Regarding gender, a significantly higher prevalence was recorded in female rather than male infected dogs with the nematode Toxocara canis (p<0.05)

DISCUSSION

The findings of the present study pertain to an identification of a variety of parasite elements in hunting dog faeces. The overall prevalence of parasites was 25.2% in the total
number of 312 fecal samples examined. *Toxocara canis* was the most common parasite, recovered from 10.4% of dogs, followed by *Ancylostomatidae* (9.8%) and *Dipylidium caninum* (8.8%)

With respect to the prevalence of gastrointestinal helminth parasites in other surveys from other areas from Greece, these record the following: Himonas (1968) refers to *Toxocara canis* 25.3%, *Ancylostoma spp* 16.1%, *Trichurus vulpis* and *D. caninum* 1.5%, while Haralabidis et al (1988), in an study including 232 healthy dogs from the area of Thessaloniki, recorded 22.4%, 3%, 2.6% and 0% respectively. A recent study (Papazahariadou et al, 2007) has estimated the prevalence of the above-mentioned parasites as 22.6%, 8.1%, 11.3% and 0% in sheepdogs and 25%, 1.3%, 12.5% and 0% respectively in hunting dogs from the Prefecture of Serres.

With respect to the prevalence of gastrointestinal parasites, surveys from other European regions have recorded a more frequent occurrence of *Dipylidium caninum* in 28%, *Toxocara canis* in 17%, *Uncinaria stenocephala* in 15% and *Trichurus vulpis* in 10% of dogs, following post mortem examinations in the town of Rome Tassi and Widenhorn (1977). In the same survey, it is mentioned that the most frequent parasite found in stray dogs in the same city was *U. stenocephala* (33.3%), and among dogs with owners the most frequent one was *D. caninum* (31.8%), which was also identified most frequently in dogs over a year of age (31.1%). From the province of Córdoba (Southern Spain), a study of 1800 animals records a prevalence of *Uncinaria stenocephala* (33.3%), *Toxocara canis* (17.7%) and *Dipylidium caninum* (13.2%) (Martinez-Moreno et al, 2007). In a one-year study of 752 dogs from the Slovak Republic (Szabová et al, 2007) intestinal endoparasites were detected as follows: *Toxocara* spp. eggs (21.9 %), eggs from the Ancylostomatidae family (18.4 %), *Trichuris* spp. eggs (10.0 %), *Toxascaris leonina* (7.3 %).

In relation to age, our study has recorded that dogs under one year of age were more frequently affected by *T. canis* than adults. Haralabidis et al have also found a significantly higher prevalence in the youngest age group, i.e. 1-3 months. Similar findings were presented by Himonas, (1968) regarding dogs from Athens and Thessaloniki, Papazahariadou et al (2007) regarding sheepdogs and hunting dogs from the Serres prefecture, Tassi and Widenhorn (1977) concerning dogs living in the city of Rome and Martínez – Moreno et al (2007) for dogs living in Gordoba.

The present study has identified a higher prevalence of the *Trichurus vulpis* and *Dipylidium caninum* infection in adult dogs rather than young dogs. Similar results were recorded by Tassi and Widenhorn (1977) and Martínez – Moreno et al (2007), whereas Papazahariadou et al (2007) refer to a higher prevalence in young dogs rather than adult sheepdogs and hunting dogs infected with *Trichurus vulpis*.

With respect to the prevalence of *Dipylidium caninum*, the present study recorded a significantly higher prevalence (8.8%) among cestodes, while Himonas (1968) estimated that the prevalence of these eggs in dog feces was 1.5%; Haralabidis et al (1988) didn’t find eggs from this parasite in the Thessaloniki area and, finally, Papazahariadou et al (2007) recorded a 0% prevalence in sheepdogs and 0.3% in hunting dogs from the Serres Prefecture. However, for dogs with owners in the city of Rome, Tassi and Widenhorn (1977) the former was the most frequently occurring gastrointestinal parasite (31.8%), found mainly in dogs over a year of age (31.1%).

Regarding the gender of the infected animals in our study, its occurrence was significantly higher in female dogs (p <0.05) infected by *Toxocara canis*, while Papazahariadou et al (2007) record its occurrence as significantly higher in male sheepdogs and hunting dogs.
The remaining parasites fond in this survey have very low prevalence, similar with others from Greece (Himonas, 1968, Haralambidis et al, 1988, Papazachariadou et al 2007).

Intestinal helminthosis in dogs can pose serious public-health concerns worldwide (Schantz, 1994, Rubel et al, 2005). So, it is important to note that this survey has recorded parasitic elements in high prevalence, widely known as potential agents of zoonosis. The provision of information to the public about the risk of their transmission to humans and the required treatment of animals in order to prevent a widespread contamination of the environment by these infective elements is an important role that, among others, veterinarians should also adopt.

REFERENCES