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PREVALENCE OF *TOXOCARA CATI* IN PET CATS BY FECAL EXAMINATION IN TABRIZ CITY, IRAN

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ABSTRACT

Toxocara is a common nematode of cats in different parts of Iran. Therefore, current study was performed on Toxocaracati from Pet cats in Tabriz, East-Azerbaijan Province, North-west Iran, based on morphological approaches, and also determination of intensity of infection. This cross-sectional study was carried out in Tabriz, capital city of East-Azerbaijan Province, situated in North-west Iran. Cats were captured from different geographic areas of the city, from 2013 to 2014. A total of 100 fresh fecal samples were collected by owners or veterinarians from household cats (n = 100) that underwent clinical examination in Three different veterinary clinics located in the named areas. 12 out of 100 cats (12%) were found infected with Toxocara nematodes. All the species were confirmed as Toxocaracati based on morphological features. Intensity of infection ranged from one to a maximum of 24Egga per cat. The most prevalent ascaridoid nematode of Pet cats in the study area was T. cati. This issue has important role in spreading of eggs in the environment and impact on human toxocariasis.

Keywords: Prevalence, *Toxocara cati*, Pet Cats, Fecal Examination

INTRODUCTION

The cat (*Feliscatus*), also known as the domestic cat or housecat to distinguish it from other felines and felids, is a small domesticated carnivorous mammal that is valued by humans for its companionship and its ability to hunt vermin and household pests. Cats have been associated with humans for at least 9,500 years. Cats can suffer from a wide range of health problems, including infectious diseases, parasites, injuries and chronic disease. Vaccinations are available for many of these diseases, and domestic cats are regularly given treatments to eliminate parasites such as worms and fleas (Hendrix and Blagburn, 1983).

Toxocara species are common asca-ridoid nematodes of cats and dogs throughout the world. They are causative agents of toxocariasis, a zoonotic parasitic disease in human with worldwide distribution. The most widespread species of *Toxocara* in dogs and cats are *Toxocara canis* and *Toxocara cati*, respectively (Despommier, 2003). Humans are infected by the ingestion of *Toxocara* eggs from contaminated soil, unwashed hands or raw vegetables. The larvae emerge in the intestine and migrate to muscle and neurological tissues, where they can remain for many years without growth, differentiation or reproduction (Holland and Smith, 2006). Some peoples may be infected by eating the larvae present in undercooked meat of infected paratenic hosts such as chickens, sheep and cattle or earthworm (Ito *et al.*, 1986). The clinical symptoms of toxocariasis depend on where in the body infected. There are several forms of toxocariasis, namely visceral larva migrans, ocular larva migrans, covert toxocariasis, and neurotoxocariasis (Taira and Fujita, 1991).

Recent epidemiological studies demonstrated the widespread prevalence of human infection with *Toxocara* in the world (Auer and Aspöck, 2004). *Toxocara* in cats has important role on human health. Prevalence of *T. cati* in cats has been estimated to vary from 0.8 to 59.3% in different parts of the world (Yamamoto *et al.*, 2009). In Iran, cats live freely in urban and rural areas, discharging *Toxocara* eggs in the environment which are transmittable to human. There are some reports of contamination of the soil in public areas with *Toxocara* eggs in Iran (Motazedian *et al.*, 2006). The prevalence of *T. cati* in cats ranges from 8% to 52.8% in different parts of Iran (Sadjjadi *et al.*, 2001).

Therefore, current study was performed on identification of some species of *Toxocara* from Pet cats in Tabriz, based on morphological approaches, and also determination of intensity of infection.

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MATERIALS AND METHODS

Sample Collection

Over the period between 2013 to 2014, 100 fecal samples (50 from male and 50 from female) of pet cats were collected in a weekly pattern from different veterinary pet animal clinics representing Tabriz city, defined as the North-west part of the Iran. Approximately 100 gm. of cat feces were collected freshly per rectum into clean polythene bags and the remainder discarded hygienically. Then samples transported to the Department of Veterinary Parasitology, Faculty of veterinary medicine, Islamic Azad University, Tabriz branch, Iran for the Laboratory Diagnosis. Animal data such as age, sex, and breed was also being collected.

Fecal Examination

Feces were stored at +4°C and examined within 48 hours. Macroscopic examination was firstly performed Subsequently, each fecal sample was divided into two groups. Flotation centrifugation methods were applied using zinc sulphate and saturated salt solution (specific gravity 1.2) as described (Dryden *et al.*, 2005). Quantitative examination was done by counting eggs per grams (EPG) of faeces using Mc Master Technique. Maximum effort was made to characterize and classify the different eggs observed under 10x magnifications to the level of genera or species (Soulsby, 1982). The parasite eggs were differentiated according to their morphologic characteristics.

Statistical Analysis

Statistical analyses were performed using SPSS 20.0 (Statistical Package for Social Science). All statistical tests were expressed as significant at 95% confidence interval.

RESULTS AND DISCUSSION

Results

Overall, 100 cats were examined in this study. As the relationships of age or sex of the animals and their infectivity with *Toxocara* was the aim of this study, therefore, 50 cats were male and the 50 females. In general, 12 out of 100 Pet cats (12%) were found infected with *T. cati* (Table-1). The intensity of infection ranged from one to a maximum of 24 Eggs per cat (Table 2) and (Figure 1).

Table 1: Infection rate of *Toxocaracati* in Pet cats

	Number	Percent	Confidence Interval%95	
			Lower	Upper
Infected cats	12	12	12.1	336
Non-infected cats	88	88	42.4	74.1
Total	100	100	-	-

Table 2: Intensity of *Toxocaracati* infection in Pet cats

		Statistic	95% Confidence Interval	
			Lower	Upper
Numbers	of	12	-	-
infected cats				
Numbers	of	1	-	-
Minimum <i>Toxocara</i> in each cat				
	Maximum	24	-	-
	Mean	9.16	4	19.48
	Std. Deviation	12.48	-	-

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Figure 1: *Toxocara cati* eggs in fecal smear of pet cats

Discussion

In association with the infection rate of *T. cati* in Pet cats collected from different parts of Tabriz City, this study showed that 12 out of 100 cats (12%) were infected. Sadjjadi *et al.*, reported the prevalence of *T. cati* on 108 cats in Shiraz 52.8% (Sadjjadi *et al.*, 2001). Another study showed that the infection rate of *T. cati* on 114 Pet cats in Shiraz was 42.6% (Zibaei *et al.*, 2007). In other studies from North (Sharif *et al.*, 2007), Northwest and Northeast of Iran (Borji *et al.*, 2011), the prevalence of infection with *T. cati* was 8-44%, 8% and 28.8%, respectively. Similar studies have been done on prevalence of *T. cati* in central parts of Iran; for example in Kashan, 113 Pet cats showed a prevalence of 13.3% (Arbabi and Hooshyar H, 2009). The prevalence of *T. cati* in Tehran was 9.4% (Pezeshki *et al.*, 2012). Although, investigation on the relationship between the prevalence of *Toxocara* and age or sex of the cats was the aim of this study, however, previous studies showed that there was no significant difference in the prevalence of infection between male and female cats (Sadjjadi *et al.*, 2001); and cats with less than 6 months old being more likely to be infected with *T. cati* than older cats (Borji *et al.*, 2011). Sadjjadi *et al.*, reported the prevalence of infection was higher in younger cats compared to older animals; however, the difference was not significant (Sadjjadi *et al.*, 2001).

In this study, the intensity of infection ranged from one to a maximum of 24 eggs per cat. In a report from Shiraz, the mean intensity of infection with *T. cati* was 6.52 with a range of 1 to 50 worms per cat (Sadjjadi *et al.*, 2001). Sharif *et al.* indicated that the intensity of infection ranged from 1 to 32 worms per cat, with a mean of 7.3 (Sharif *et al.*, 2007). In other study in Pet cats from north of Iran, the mean intensity of infection with *T. cati* in cats was an average of 3 *T. cati* in each cat (Changizi *et al.*, 2007). This issue is important respect to the distribution of *T. cati* eggs in environment, because every female *Toxocara* shed about 200000 eggs per day (Glickman and Schantz, 1981) that will become capable of transmission to human and paratenic hosts after development in the soil.

The result of this study is coincident with the previous studies in Iran (Sadjjadi *et al.*, 2001) indicating that the infection of cats with *Toxocara* nematodes in this city is considerable. The high infection rate of *T. cati*, high intensity of infection have important role in distribution of *Toxocara* eggs into the environment and their transmission to humans.

Conclusion

The result of this study implies that *T. cati*, as the most prevalent acaridoid nematode of cats in the study area, might have the most important role in human toxocariasis in that area, but further studies on human cases will better clarify this issue.

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Competing Interests

Authors have declared that no competing interests exist.

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