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ASSESSMENT OF *TOXOCARA CATI* INFESTATION IN PET CATS

ALI ASGAR SHOKRI¹, ALI SHABESTARI ASL^{1*}, YAGOOB GAREDAGHI²

1: Department of Clinical Sciences, Tabriz Branch, Islamic Azad University, Tabriz, Iran.

2: Department of Pathobiology, Tabriz Branch, Islamic Azad University, Tabriz, Iran.

* Corresponding Authors Mail: shabestari@iaut.ac.ir

ABSTRACT

Toxocara is a common nematode of cats in different parts of Iran. Therefore, current study was performed on *Toxocara cati* from pet cats in Tabriz, East-Azerbaijan Province, North-west of Iran, based on morphological approaches, and also determination of intensity of infection. This cross-sectional study was carried out in Tabriz. Cats were captured from different geographic areas of the city, from February to November 2014. A total of 50 fresh fecal samples were collected at the examination and their hospitalization time (n = 50). Three to five gram of specimen from each cat were collected for parasitological examinations. Four out of 50 cats (8%) were found infected with *Toxocara* nematodes. All the species were confirmed as *Toxocara cati* based on morphological features. Intensity of infection ranged from one to a maximum of 29 Eggs 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: *Toxocara cati*, Pet Cats, Tabriz, Iran

INTRODUCTION

The incidence of cats' intestinal parasites is prevalent and reported from word wide. These parasites can make dangerous diseases in cats and sometimes death may occur in heavy infestation.

Meanwhile, infected cats can acts as a reservoir for some gastro-intestinal parasites

like as *Toxocara cati*, *diplydium caninum* and *Toxoplasma gondii*. Therefore, these reservoirs infected cats can acts as a potential source of contamination of human environments.

Toxocara cati is a common nematode of cats and have a worldwide distribution. This

is a zoonotic parasitic disease and human *Toxocariasis* reported from different countries. Visceral larva migration may occur when human is infested by ingestion of *Toxocara* eggs from contaminated water and soil, unwashed hands or raw vegetables. In addition to ingestion of *Toxocara* eggs, eating the larvae present in raw or undercooked meat of infected paratenic hosts can lead to *Toxocariasis* in humans too [1]. The larvae emerge in the intestine and migrate to other organs like as muscle or nervous system, where they can remain for many years without growth, differentiation or reproduction [2].

The clinical symptoms of *toxocariasis* are varying in human and cats and depend on which organ of the body infected. Migration of larvae in cats and humans in visceral tissues is harmful and may lead to death. But sometimes, these parasites can migrate to ectopic places like as eyes, nervous or genital organs [3]. Reports showed that *ascarides* and hook worms are the most important cats' parasites in the world and unfortunately, they can act as a potential reservoir and may transmit these parasites to human being or other pet animals [4, 5]. Furthermore, close contact of infected pet cats with the owners or other animals facilitate this transmission. Based on different reports, prevalence of *Toxocara*

cati ranges from 0.8% to 59.3% in different parts of the world [6, 7].

In Iran, cats live freely in urban and rural areas, discharging *Toxocara* eggs in the environment which are transmittable to human. Even house cats in Iran have a free roaming life and this matter makes more dealing with the infections.

There are some reports of contamination of the soil in public areas with *Toxocara* eggs in Iran [8]. The prevalence of *T. cati* in cats ranges from 8% to 52.8% in different parts of Iran [9]. With attention to the importance of *Toxocariasis*, current study was performed on identification of species of *Toxocara* spp. from Pet cats in Tabriz, based on morphological approaches, and also determination of intensity of infection.

MATERIALS AND METHODS

Sample collection

This cross-sectional study was performed from February to November 2014, in Tabriz, capital city of East-Azerbaijan Province, situated in North-west Iran. Fifty pet cats were selected randomly from cats that were bring to different pet clinics by donors and all of them were in good health position and without any signs of systemic or infectious diseases. None of each owner had complaint about any diseases and all cats were referred for usual examination or for annual vaccinations.

A total of 50 fresh fecal samples were collected by donors or veterinarians from these pet cats (n = 50) that underwent clinical examination. At clinical examination, data about individual features (age, sex, breed, and presence/absence of clinical signs) and management of animals were recorded by clinicians.

Fecal Examination

Feces were stored at +4°C immediately after receiving and examined within 48 hours. Each fecal sample was divided into two groups. Macroscopic examination was firstly performed. In order to detect parasite eggs one group was subjected to microscopic analysis by centrifugation-flotation technique with sucrose and sodium nitrate solution (specific gravity: 1370). The parasite eggs were differentiated according to their morphologic characteristics.

Statistical analysis

Statistical analyses were performed using SPSS 13.0 (Statistical Package for Social Science). All statistical tests were expressed as significant at 95% confidence interval.

RESULTS

Overall, 50 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, 25 cats were male and the 25 females. In general, 4 out of 50 pet cats (8 %) were found infected with *T. cati* (Table 1). The intensity of infection ranged from one to a maximum of 29 Eggs per cat, (Table 2) and (Figure 1).

Table 1: Infection rate of *Toxocara cati* in Pet cats in Tabriz, Iran

	Number	Percent	95 %Confidence Interval	
			Lower	Upper
Infected cats	4	8	11.3	43.8
Non-infected cats	46	92	52.1	84.2
Total	50	100	-	-

Table 2: Intensity of *Toxocara cati* infection in Pet cats in Tabriz, Iran

	Statistic	95% Confidence Interval	
		Lower	Upper
Numbers of infected cats	4	-	-
Numbers of <i>Toxocara</i> in each cat	Minimum	1	-
	Maximum	29	-
	Mean	9.25	18.43
	Std. Deviation	11.46	-



Figure 1: *Toxocara cati* egg in fecal smear

DISCUSSION

The incidence of cats' intestinal parasites are prevalent and reported from worldwide. These parasites can make dangerous diseases in cats and sometimes death may occur in heavy infestation. Meanwhile, infected cats can act as a reservoir for some gastro-intestinal parasites like as *Toxocara cati*, *diplidyium caninum* and *Toxoplasma gondii*. Therefore, these reservoir cats can act as a source of contamination of human environments. The presence of infected cats can be dangerous to humans and this can be very important for family members, especially children who are in close contact with domestic and infected pet cats. Many studies showed high rates of infestation in urban pet cats and because of contacting of infected cats with pets and contaminating of environment show the importance of study about parasites burdens in these cats. It seems that toxocariasis is the most common cats' intestinal parasite. Cats are very sensitive to many diseases and parasite infestations because of their free-roaming possessions. So they can be exposed to many infectious and parasitic diseases [5].

Reports showed that ascarides and hook worms are the most important cats' parasites in the world and unfortunately, they can act as a potential reservoir and may transmit these parasites to human beings or other pet animals [5]. Furthermore, close contact of

infected pet cats with the owners or other animals facilitate this transmission. Even despite the lack of human interaction with the animals, due to environmental contamination (pollution), there are the high risks of disease for human by excreting eggs in the feces of infected animals.

Based on different reports, *Toxocara* is the most prevalent parasite in cats and human can infect by direct ingestion of *Toxocara* eggs or by contaminated water and soil, unwashed hands and row herb. Approving of this issue showed by recent studies that human toxocariasis has been observed in all part of the world and based on different reports, prevalence of *Toxocara cati* ranges from 0.8% to 59.3% in different parts of the world [6].

Based on our results the infection rate of *T. cati* in pet cats collected from different parts of Tabriz City was 4 out of 50 cats (8%). Sadjjadi et al. reported the prevalence of *T. cati* on 108 cats in Shiraz 52.8% [9]. Another study showed that the infection rate of *T. cati* on 114 Pet cats in Shiraz was 42.6% [10]. Other studies confirm the presence of *T.cati* infestation range from 8 to 44% [11, 12]. 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% [6]. The prevalence of *T. cati* in Tehran was 9.4% [13]. 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 [9]; and cats with less than 6 months old being more likely to be infected with *T. cati* than older cats [11]. Sadjjadi et al. reported the prevalence of infection was higher in younger cats compared to older animals; however, the difference was not significant [9]. In this study, there was no relation between sex and age with *T. cati* infestation. In this study, the intensity of infection ranged from one to a maximum of 29 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 [9]. Sharif et al. indicated that the intensity of infection ranged from 1 to 32 worms per cat, with a mean of 7.3 [12]. 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 [14]. This issue is important respect to the distribution of *T. cati* eggs in environment, because every female *Toxocara* shed about 200000 eggs per day [15] 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 [9] 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.

Furthermore, the infected pet cats belong to free roaming cats and none of household cats showed parasitic infections. All cats had antihelminthic therapy in every 3 to 6 months per year and even that's cats were infected had antihelminthic therapy. This matter shows the role of free roaming life of these cats and efficacy of parasitic therapy. Because of prepared parasitic therapy, household cats hadn't parasite. But free roaming cats showed the risk of infestation even with antehelminthic therapy.

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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