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***Toxocara cati* infection in cats in Tehran and their importance in medicine**

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ABSTRACT

Toxocara cati is the cause of a helminthic zoonosis. It is one of the agents that causes visceral larva migrans in humans. So, infected cats are a high risk of infection for people. Obtaining accurate information about *Toxocara* infection in cats could be helpful in control and prevention of it in people. Because of the high number of cats in Iran and their constant contact with humans, we undertook the current study to determine the frequency of *Toxocara* in cats. 138 Samples were collected from different parts of Tehran city and the fecal samples were examined by the formol-ether concentration technique. 13 samples (9.4%) of 138 samples contained *Toxocara* eggs.

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1. Introduction

Toxocariasis is a parasitic zoonosis with a world wide distribution. It is caused by the ascarids of dogs and cats (Shabbir et al., 2010). The major source of *Toxocara cati* infection is eggs passed into the environment by infected cats (Khazan et al., 2012). However, because the eggs are resistant to degradation and sterilization, the environment forms a reservoir of infection. Larval maturation happens within the egg and takes ~ 3-4 weeks at

room temperature (Tiyo et al., 2008). People become an incidental host for *Toxocara* when they ingest the eggs of the parasite, chiefly by hand – to- mouth contact, from exposure to areas polluted with *Toxocara* eggs, such as contaminated soil in public parks. Traditional risk factors for *Toxocara* infection contain exposure to a litter of puppies, exposure to play grounds and sand boxes, and urban or rural place of residence (Rubinsky-Elephant et al., 2010). *Toxocara* can not complete its life cycle in humans and parasite is retained at the second larval (L2) stage. Migrating L2 give rise to the clinical syndromes of visceral larva migrans (VLM), ocular toxocariasis (OT) and covert toxocariasis (Magnaval et al., 2001). Acute infections are delineated by an inflammatory reaction Consisting of combinations of eosinophils, neutrophils, and monocytes. In more chronic infections, the larva become encapsulated by mature granulomas comprised of a central core of multi nucleated cells and leukocytes. The inflammatory response is thought to be initiated by the *Toxocara* excretory and secretory products, antigens that are released by the migrating larva (Schantz, 1989, Hotez, 1993 and Despommier et al., 1994). Diagnosis of human toxocariasis normally depends on an aggregate of the presence of clinical signs and symptoms backed by positive serology (Noordin et al., 2005). Treatment for toxocariasis, applying albendazole or ivermectin should be regarded (Ecevit et al., 2013). Most cases of human toxocariasis are preventable by simple actions such as meticulous personal hygiene, treatment of dogs and cats and not allowing children to play in environments that are contaminated with dog and cat excrements (Baboolal and Rawlins, 2002). Because there are high number of cats in Iran and close relation between human and cat, in the current study we examined the frequency of the infection of *Toxocara* in cats.

2. Materials and methods

128 fecal samples from stray and semi-stray cats from different parts of Tehran city and 10 specimens from domestic cats, 6 males and 4 females, were collected. Sampling was performed in all 4 seasons of the year. Specimens from stray and semi-stray cats were collected freshly from cats which were in cage and some samples were gathered from places where feces were left. Samples from domestic cats were collected freshly by their owners. All the cats and samples were transferred to Behdasht Faculty of Tehran Medical Sciences. 1 gram of Specimens were examined by formol-ether concentration (Brown, 1993) followed by microscopy. The preparations were evaluated under 100X magnification. Parasites were recognized by their morphology. In form *T. cati* eggs are almost spherical with a thin outer shell which has small dents. They measure from 66 to 71µm in diameter and are dark brown in colour.

3. Results

A total of 138 cat fecal specimens were screened for the presence of *T. cati* eggs. In stray and semi-stray cats we can't estimate their age. The age of the domestic cats was from 3 to 9 months with an average age of 6 months. The overall frequency of *T. cati* was 9.4% (n=13), in stray and semi-stray cats 8.6% (n=11), in domestic cats 20% (n=2); attentive to that 2 males infected with *T. cati* (Table 1).

Table 1

Frequency of *Toxocara cati* eggs in feces of stray and semi-stray and domestic cats in Tehran.

Stray and semi stray cat	Age	Sex	No. of feces examined	Infected with <i>Toxocara</i>	Percent
	-	-	128	11	8.6
Domestic cat	Average 6 month	Male	6	2	
		Female	4	-	
		Total	10	2	20
		TOTAL	138	13	9.4

Furthermore *Giardia* cysts were found in 10.14% (n=14) of the cats, in stray and semi-stray cats 6.25% (n=8), in domestic cats 60% (n=6); attentive to that 4 males and 2 females infected with *Giardia* (Table 2). In addition, *Coccidia* oocysts were observed in 5 samples.

Table 2

Frequency of Giardia cysts in feces of stray and semi-stray and domestic cats in Tehran.

Stray and semi stray cat	Age	Sex	No. of feces examined	Infected with Toxocara	Percent
	-	-	128	8	6.25
Domestic cat	Average 6 month	Male	6	4	
		Female	4	2	
		Total	10	6	60
		TOTAL	138	14	10.14

4. Discussion

In present investigation we assessed the frequency of *Toxocara cati* and other intestinal parasites in 128 stray and 10 domestic cats in Tehran city.

T. cati is the common ascarid of cats. However, there is a body of data distributed through the literature that implicates *T. cati* as a zoonosis (Fisher, 2003). Infection of cats with *T. cati* can take place either through ingestion of infective eggs or from eating rodents harboring larvae in their tissues. Since the cats habitually hide their faces, source of infection through ingesting infective eggs is less likely to occur than from the predatory habits of cats. Many stray cats found in various residential regions of Tehran city and in other residential areas of Iran, and their population is quickly in expanding. This can significantly contribute to the distribution of the viable *Toxocara* egg into the environment and their transmission to humans. Thus the environment is the principal origin of infection for humans and can also be the major reservoir for feline infection (Engbak, 1984). *T. cati* is one of the cause of visceral larva migrans in humans. So, infection of cats has a high risk of infection in human. Each female *T. cati* lays a total of 200,000 eggs per day. Hence, each cat is able of infecting a high proportion of the population. Therefore, accurate information about the *Toxocara* infection in cats can help the control and prevention of it in human. According to the result of this study, infection rate in cats in Tehran was found 9.4% (8.6% in stray & semi-stray cats and 20% in domestic cats). Earlier studies in Tehran indicated an infection rate of 31.4% in domestic cats (Mirzayans, 1971). During a study carried out by ziapour in Sari city infection rate in cats 44% reported (ziapour, 2005).

In Shiraz city zibaei reported 14.3% (zibaei, 2005). Arbabi & Hooshiar in kashan city found 13.3% infection rate in cats (Arbabi and Hooshiar, 2005). There fore, there is a need for an increased understanding of the epidemiology of infection in cats because there are many areas in Iran where knowledge is sparse.

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