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Original Article

Prevalence of Protozoa and Gastrointestinal Helminthes in Stray Cats in Zanzan Province, North-West of Iran

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Abstract

Background: Cats and other felines act as definitive hosts for many intestinal parasites, some of which are responsible for several zoonotic diseases. The aim of this study was to determine the type and prevalence of protozoa and gastrointestinal helminthes among stray cats.

Methods: A cross sectional study was conducted. Digestive tracts of 100 stray cats in Zanzan Province, north-west of Iran were autopsied in order to recognize gastrointestinal helminthes and intestinal protozoan parasites. These cats were collected by baited cage trapped from October 2007 to September 2008. Gender and species of helminthes and protozoa were recognized using authentic diagnostic criteria. Statistical evaluation was performed by SPSS version 14.

Results: Forty-two percent of cats were infected with intestinal protozoan parasites, 33% were infected with cestodes and 39% infected with gastrointestinal nematodes. Four species protozoan parasites and eight gastrointestinal helminthes were recovered from the animals, including *Taenia taeniaeformis*, *Dipylidium* spp., *Joyeuxiella pasqaulei*, *Toxocara cati*, *Physoleptera praeputialis*, *Rectalaria* spp., *Onicolla*, *Cystoisospora* spp., *Toxoplasma gondii*, and *Sarcocystis* spp .

Conclusions: The high infection rate of *Toxoplasma* and some gastrointestinal helminthes in stray cats is considered to be critical from the viewpoint of public health importance.

Keywords : *Cat, Gastrointestinal, Helminthes, Protozoa, Iran*

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Introduction

Cat is one of the hosts of common parasitic and microbial agents due to nutritional and biological conditions. Today, stray cats live in urban societies and get their nutritional needs from the food wasted by human. This leads to a close relationship between cat and human. Nowadays different species of this animal are living in our houses. In Iran, regarding to the cultural and religious believes, having pet is less common. However, lack of consideration to the health of these animals could decrease the health of urban life.

We conducted this study in order to determine the contamination status of cats in Zanjan Province in terms of helminthes and gastrointestinal protozoa. The results of this study can be important for pet clinicians.

Materials and Methods

In this cross-sectional study during the period of October 2007 to September 2008, a total of 100 (50 males and 50 females and 25 samples in each seasons) cats were captured by trapping (baited cage-traps) from different regions of Zanjan City and other cities of Zanjan Province, north-west Iran. All of the methods used in this study were confirmed by the Ethics Committee of Tehran University (Confirmation No B-86/955 Iran S.P.C.A).

The trapped cats were fixed by two pieces of wood at the corner of the cage and anesthetized by 3ml ketamine 10% and then killed. Then, their digestive system and derivative organs were discharged from abdominal space and stomach, liver, pancreas and digestive canal were opened and their contents were passed from sieve (pour size 60) and intestine mucus was examined. Iso-

lated helminthes were kept in alcohol 70° to be recognized later in the lab. To study the intestinal protozoa, some of faces were investigated as well. After floating the faces with floatation solutions such as Shiter solution, it was tried to recognize oocysts or parasitic cysts. Gender and species of helminthes were recognized using limpid or stained method (Karmen staining). Protozoan oocysts were measured by micrometer as well.

Statistical evaluation was performed by SPSS version 14 and statistically significance was defined as $P < 0.05$.

Results

Forty two percent of cats were infected with intestinal protozoan parasites, 33% with cestodes and 39% with gastrointestinal nematodes. There was a significant increase in the frequency of infection of *Joyxiella pasqualei* in the females as compared to the males ($P < 0.05$). There was a significant increase in the frequency of infection of *Ancylostoma oncicola* in males comparing to females ($P < 0.05$). Other species had no difference among the males and females (Table 1). Concurrent infection with two or more species was observed in most of the stray cats.

Results demonstrated no significant difference in infection with protozoa and helminthes among cats among seasons or among cities. According to Table 1, the maximum rate of intestinal helminthic incidence was related to *Physaloptera praeputalis* (88%) and minimum rate to *Toxacara cati* (8%). Maximum incidence was connected to *Cystoisospora rivolta* (80%) and minimum to *Sarcocystis* (10%).

Table1: Helminthes and parasites were found in stray cats in Zanjan

Species	Infection (%)
<i>Joyxiella pasquale</i>	55
<i>Cystoisospora rivolta</i>	80
<i>Cystoisospora felis</i>	70
<i>Toxoplasma gondii</i>	42
<i>Sarcocystis</i>	10
<i>Taenia taeniformis</i>	18
<i>Dipylidium caninum</i>	21
<i>Dipylidium noleri</i>	23
<i>Dipylidium acanthotera</i>	41
<i>Toxocara cati</i>	8
<i>Physaloptera</i>	88
<i>Rectalaria</i>	26
<i>Opisthorchis</i>	33
<i>Onicolla</i>	34

Table 2: Contamination of protozoan parasites and helminthes reported by different studies

Type of parasite	Place	Percent	Reference
<i>Toxoplasma</i>	Tasmania	50	8
	Kimberly	1.15	9
	Mexico	1.3	1
	Dubai	0.8	11
	Denmark	25	12
	Turkey	47	13
	Belgium	60	3
<i>Toxocara cati</i>	Greece	7.66	13
	Shiraz	42.6	14
	Northern part of Iran	44	15
<i>Opsithorchis felines</i>	Germany	16	4
<i>Joyexella pasqualei</i>	Turkey	50	16
	Germany	0.1	4
<i>Diplidium caninum</i>	Netherlands	0.7	17
	<i>Physaloptera</i>	42.2	
<i>Dipylidium noleri</i>	Northern part of Iran	25.3	18
		<i>Dipylidium canium</i>	9.4

Discussion

The Rate of gastrointestinal helminthes including 40% among Mexican stray cats (1), 26% among kitten (2), 1.36% among Belgian cats (3), 97% among German cats (4), 9.60% among Kuwaitian cats (5) and 34% among Spanish cats (6) show that stray cat can be infected by one of intestinal helminthes. Studies reported by Mirzayans (7), showed that 46% of stray cat were contaminated by one of intestinal helminthes. What multiplies the importance of statistics and present figures is that some of protozoan parasites and helminthes including *Toxocara cati* and *Opisthorchis* are common which have significant incidence in all conducted studies (1-10). Studies indicated a high percent of some of the common species.

Results of contamination rate of protozoan parasites and helminthes reported by different studies are shown in Table 2. According to the obtained results of stray cats in the province of Zanjan, contamination percentage of *Joyxiella*, *Physoleptera* and *Dipylidium caninum* are high. There are limited researches regarding to the gastro-intestinal coccidian contamination rate in Iranian cats. However, current study showed that about 75% of Zanjan's cats were contaminated by one of both species of *Cystoisospora*.

The high infection rate of *Toxoplasma* and some gastrointestinal helminthes in stray cats is considered to be critical from the viewpoint of public health importance. Hence, it is imperative that appropriate control strategies and measures be implemented to prevent and control the infection of stray cats with helminthes and protozoa in Zanjan.

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cal support. The authors declare that they have no conflicts of interest.

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