

## Brief Report

## Identification of Zoonotic Parasites isolated from Stray Dogs in Bojnurd County Located in North-East of Iran

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Received: 26 December, 2015; Accepted: 31 May, 2016

### Abstract

Dog can represent as an important source of zoonotic disease and important health problem for human. They can carry dangerous parasitic diseases such as hydatidosis, toxocariasis and *Coenurus cerebralis* to humans and animals. This study was performed in order to determine the prevalence and intensity of zoonotic parasites among stray dogs from Bojnurd, the capital city of North Khorasan province in North West of Iran. During a program performing by Bojnurd municipal on the slow killing of stray dogs, 32 dogs from Jun 2013 till March 2015 were selected. At necropsy their alimentary canals were removed and to identify the species of helminthes, the nematodes were cleared in lactophenol and cestodes were stained using carmine acid. Intestinal protozoan parasites were detected with parasitological methods. 28 (87.5%) of 32 stray dogs infected at least with one helminth. Seven species of cestodes were isolated from examined dogs and three species of nematode were detected. *Giardia sp.* and *Cryptosporidium sp.* detected from fecal samples. This is the first study of the prevalence of intestinal zoonotic parasites in dogs in this area. It seems control of bearing stray dogs can help human health and reduction economic losses caused by stray dog's zoonotic parasites.

**Keywords:** parasitic infection, zoonotic, dog, Bojnurd

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Please cite this article as: Arzamani K, Rouhani S, Sedeghi S, Rostami M, Raeghi S. Identification of Zoonotic Parasites isolated from Stray Dogs in Bojnourd County Located in North-East of Iran. Novel Biomed. 2016;4(4):185-8.

### Introduction

Dog can represent as an important source for zoonotic disease in human and parasite infection to various animal species<sup>1,2</sup>. Close contact with humans also harbors transmission risk of zoonotic agents. The numbers of stray dogs that coexist with human being is high in most cities and because of this bring about the great quantity of feces, which constitute a potential risk of infection for human beings<sup>3</sup>.

Zoonotic disease such as visceral and ocular larval migrans, Hydatid disease and visceral leishmaniasis are some zoonotic aspects of parasitic infections in dogs<sup>4,5</sup>. In addition, dogs are reported to act as transport host of many protozoa and worms of man when they ingest infected human feces<sup>6,7</sup>.

Multiple studies have been conducted in Iran and several results are obtained. They include the studies of stray dogs in Mashhad, Semnan, Ilam, Hamadan and Kashan<sup>7-10</sup>.

Little is currently known about the recurrence rates of zoonotic parasites in dogs in northeast of Iran. This study was performed in order to determine the prevalence and intensity of parasitic infections among stray dogs from Bojnurd, the capital city of North Khorasan province in Iran with emphasis the importance of zoonotic concept for human.

## Case Report

In this descriptive study, 32 stray dogs from Bojnurd, the capital city of North Khorasan province during a program performing by municipal officers on slow killing of stray dogs from Jun 2013 till March 2015 were selected. Fecal samples were obtained directly from the rectum and examined by standard techniques. Fecal specimens were concentrated by the formalin- ether sedimentation method. Fecal smears of the sediment (20µl) were made and stained by the modified Ziehl- Neelson technique. The complete surface of the smear was examined for

**Table 1:** The prevalence of nematodes in dogs from 32 stray dogs Bojnurd.

cestodes	Infected Dog	
	number	%
<i>Toxocara canis</i>	3	9.3
<i>Spirocerca lupi</i>	1	3.1
<i>Tichuris sp.</i>	1	3.1

**Table 2:** The prevalence of cestodes in dogs from 32 stray dogs Bojnurd.

cestodes	Infected Dog	
	number	%
<i>Taenia multiceps</i>	8	25
<i>Taenia ovis</i>	14	43.7
<i>Taenia hydatigena</i>	22	68.7
<i>Mesocestoides lineatus</i>	10	31.2
<i>Dipylidium caninum</i>	12	37.5
<i>Echinococcus granulosus</i>	20	62.5

**Table 3:** The frequency of protozoan parasites in dogs from 32 stray dogs Bojnurd.

parasite	No. of infected dogs	%
<i>Cryptosporidium sp</i>	1	3.1
<i>Isospora sp, a</i>	1	3.1
<i>Giardia sp</i>	3	9.3
<i>Entamoeba sp</i>	0	0

*Cryptosporidium* oocysts<sup>11</sup>. Smear of the faeces were prepared and stained with trichrome and iodine stains to detect cysts or trophozoites of *Giardia* and *Entamoeba*<sup>12</sup>. Also, fecal samples were examined using flotation technique in saturated sodium chloride solution, centrifuge-flotation technique in zine sulphate, density 1.18 g/ml, and centrifuge-flotation technique in sucrose solution. Also all samples from dogs were examined individually for helminthes egg, coccidian oocysts.

At necropsy, their alimentary canals were removed and the contents of each part were washed in laboratory and lining membrane of small intestines was gently scraped with a scalpels blade and the contents were examined under a Light microscope. The large worms were collected from the washed materials. Cestodes were stained with carmine acid and the nematodes were cleared in lacto phenol and were identified according to morphological characteristics.

28 (87.5%) of 32 stray dogs (20 males and 12 females) infected at least with one helminth. Seven species of cestodes were isolated from examined dogs. 3 species of nematode were detected from dogs. Only one dog was found with one nematode that it was a female *Toxocara cani* (Table 1). *Echinococcus granulosus*, *Taenia multiceps*, *Dipylidium caninum*, are important zoonotic cestods that isolated with affected dogs (Table 2). Zoonotic protozoa species detected in 15.6% of stray dogs. *Cryptosporidium sp.*, *Isospora sp.*, and *Giardia sp.* were detected. *Entamoeba sp.*, was not found in samples. Frequency of intestinal protozoa shows in Table 3.

## Discussion

Our study indicated that high level of parasitic infection in dogs in this region of Iran. Also, 87.5% of stray dogs were infected with at least one helminthic parasite. The prevalence of gastrointestinal parasites can vary widely, based in part on methodology, location, and the population studied.

In this study, the most prevalent nonzoonotic helminth parasite was *Taenia hydatigena*. Infectivity of dogs with this helminth, with higher prevalence in older dogs, has also been reported by other researchers<sup>13,14</sup>. *T. hydatigena* infection can cause significant damage to the economy and rate in this study was similar to

study from Mashad<sup>7</sup>.

62.5% of dogs were infected to *E. granulosus*. This parasite is prevalent in stray dogs and other canids with different intermediate hosts in different parts of Iran. Human cases are also regularly reported with the rate of 0.6-1.2/100000 as well as infectivity of different intermediate hosts<sup>4,15</sup>.

Larval stage of *Taenia multiceps* is *Coenurus cerebralis* seems to be reported from man in Iran and is an uncommon infection in small ruminants but infection rate in this study is agreement with others reports<sup>16</sup>.

*Dipylidium caninum* is a cestod with zoonotic importance and fairly common parasites of Iranian stray dogs however it is unclear according to the life cycle of this parasite, the human cases is low<sup>17</sup>.

The prevalence of *Toxocara canis* in dogs was lower than studies in Mashhad and Semnan. Age of dog and environmental factors can cause this difference<sup>7,13</sup>. Consequently few case reports exist on the human visceral larva migrans (VLM) induced by *T. canis* in Iran<sup>18</sup>.

In present study prevalence of *Giardia* infection is approximately similar to other reports of Iran but it is better to identify of assemblage of that because of zoonotic importance. High prevalence of *Giardia* infection has been reported in other country<sup>19</sup>. In one dog coinfection of *Giardia* and *Isospora* was detected. *Isospora* is a common parasite and main intestinal protozoa found in dogs<sup>9</sup>. Also in this study *Cryptosporidium* infection was low and it seems that infection rates are variable according to geographic area<sup>19</sup>.

## Conclusion

The results of this study indicate that the dogs are one main human public health risk. Some zoonotic disease like VLM and hydatidosis are important in endemic area. It seems that controlling of stray dogs population with program performing by municipal on slow killing of stray dogs can help human health and reduction economic losses caused by stray dog's zoonotic parasites.

## Acknowledgments

The authors would like to appreciate municipal

employees and the others helped us during this study. This study was supported by the Deputy of Research, North Khorasan University of Medical Sciences (Research No: 676).

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