A Survey for Internal and External Parasites in Stray Doges in Falluja (Iraq)

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Abstract

Forty seven dogs sacrificed, necropsied and their organs were examined for the presence of parasites The nematodes found were: *Toxocara canis* in 11dogs (23.4%), *Toxascaris leonina* in 2 dogs (4.25%) and *Ancylostoma caninum* in 6 dogs (12.76%). The cestodes includes: *Dipylidium caninum* in 19 dogs (40.42%), *Taenia spp*. in 21 dogs (44.68%), and *Echinococcus granulosus* in 7 dogs (14.89%). *Dicrocoelium dendriticum* a unique Trematod was found in the intestinal contents of one of these dogs (2.12%). *Babesia canis* was the only blood protozoa detected in 7 dogs (14.89%). However, *Sarcocystic spp*. oocysts were found in 4 dogs (8.51%). The ectoparasites recovered were: *Rhipicephalus sanguineus* (tick) in 13 dogs (27.65%), *Trichodectus canis* (louse) in 7 doges (14.89%) and 1 species of fleas *Ctenocephalides canis* in 6 dogs (12.76%). The public health importance of these parasites was discussed.

مسح الطفيليات الداخلية والخارجية في الكلاب السائبة في الفلوجة (العراق)

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الخلاصة

لقد تمت دراسة الطفيليات الداخلية والخارجية في 47 كلبا سائبا قتلت في مدينة الفلوجه (العراق). وقد تبين من خلال النتائج بان معظم هذه الكلاب خمجة بالطفيليات الداخلية والخارجية وقد كانت نسبة الخمج بالديدان الاسطوانية وكما يلي: (11) كلبا مصابا بدودة *Toxocara canis* (23.4%)، وكلبان مصابان بدودة *Toxascaris leonina* (4.25%)، و(6) كلاب مصابة بدودة *Ancylostoma caninum* (12.76%)، وكانت نسبة الخمج بالديدان الشريطية هي (19) كلبا (40.42%) مصابا بالدودة *Dipylidium caninum* و(21) كلبا (44.68%) مصابا بالدودة *Taenia spp.* و(7) كلاب (14.89%) مصابة بالدودة *Echinococcus granulosus*. أما الخمج بالمثقوبات فقد كان بدودة واحدة هي *Dicrocoelium dendriticum* ونسبة الخمج بها هي (2.12%).

من جهة أخرى فقد وجد بان هذه الكلاب كانت خمجة بطفيليات الاوالي والطفيليات الخارجية فقد وجد بان (7) كلاب (14.89%) خمجة بـ *Babesia canis* وأن (4) كلاب (8.51%) خمجة بـ *Sarcocystic spp.*.

أما فيما يتعلق بالطفيليات الخارجية فقد وجد بان القراد من النوع *Rhipicephalus sanguineus* موجودا في (13) كلبا (27.65%) وان (7) من الكلاب (14.89%) كانت مصابة بالقمل من النوع *Trichodectus canis* وكانت (6) من الكلاب (12.76%) مصابة ببراغيث من النوع *Ctenocephalides canis*. وقد جرت مناقشة أهمية هذه الطفيليات للصحة العامة وصحة الحيوانات.

Introduction

Dogs are in close contact with human beings. They could be a health hazard for human, particularly when they are infected with agents of zoonotic disease. Several species of parasites have been reported in dogs among which Echinococcus granulosus stands the most threat to human health.

Various species of parasites, have been seen in Iraq particularly in stray dogs (1),(2),(3).

The objectives of the current work were to study the parasitic fauna in stray dogs in Falluja area and to study the rate of infection with each parasites, particularly *Echinococcus granulosus*.

Material and Methods

Forty seven stray dogs were included in this study. Twenty eight of them (59.6%) were from outskirts of Falluja city, the others were from different public squares of city center. The dogs were shot and blood smears were made immediately for the examination of blood parasites. The dogs were necropsied within 1 hour of shooting. The hair and the skin of the dogs were carefully searched for external parasites. The parasites were collected and fixed in (10%) formalin and stored for further investigations (4).

The carcasses were opened, and the internal organs were examined carefully for parasites and lesions. The worms were collected from the intestine and fixed in 70% methanol for further diagnosis (5).

The parasites collected from each dog were kept in separate jars for each group of parasite. Ectoparasites were mounted with Canada balsam on slides and diagnosed. The nematodes were dehydrated in 80%, 90% and absolute alcohol and xylol for 15 minutes in each passage, stained with lactophenol, mounted with Canada balsam on slides and examined for diagnosis. Blood smear were stained with gimsa stain and examined for blood parasites. Fecal samples were processed for parasite eggs and for protozoa by using floatation method with saturated sodium chloride solution and sedimentation technique (6). The results of each examination were recorded.

Results

1. Internal parasites:

Three species of nematodes were detected in these dogs. These were: *Toxocara canis* in 11 dogs (23.4%), *Ancylostoma caninum* in 6 dogs (12.76%) and *Toxascaris leonina* in 2 dogs (4.25%).Three different species of cestodes were also found. These are *Dipylidium caninum* in 19 dogs (40.42%), *Taenia* spp. in 21 dogs (44.68%) and *Echinococcus granulosus* in 7 dogs (14.89%). A trematode species *Dicrocoelium dendriticum* was seen in one dog (2.12%). Besides these, 2 species of protozoa were also detected. The blood protozoa, *Babesia canis* was found in 7 dogs (14.89%) and *Sarcocystis spp*. in 4 dogs (8.51%).

2. External parasites:

The highest rate of infestation with ectoparasites was with a single species of tick *Rhipicephalus sanguineus*, there were 13 dogs (27.65%) which were infected with this arachnid. A single species of lice *Trichodectus canis* was found in 7 dogs (14.89%). One species of fleas was also found in these dogs, this was *Ctenocephalides canis* in 6 dogs (12.76%).

Table (1) I illustrates the parasite species, number of infected dogs and it's percentage

Parasite species		No. of dogs	%
Nematodes	*Toxocara canis*	11	23.4
	Ancylostoma caninum	6	12.76
	Toxascaris leonina	2	4.25
Cestodes	*Dipylidium caninum*	19	40.42
	Taenia spp.	21	44.68
	Echinococcus granulosus	7	14.89
Trematodes	*Dicrocoelium dendriticum*	1	2.12
Protozoa	*Babesia canis*	7	14.89
	Sarcocystis spp.	4	8.51
Ectoparasites	*Rhipicephalus sanguineus*	13	27.65
	Trichodectus canis	7	14.89
	Ctenocephalides canis	6	12.76

- **There are several cases of mixed infection (by two or more of these parasites).**

Discussion

This study explains that there are several types of infections with endoparasites and ectoparasites: *Dicrocoelium dendriticum* an important harmful trematod to the digestive system of dog (7).

Toxocara canis is one of the most dangerous nematodes because its larvae are the causative agent of visceral larvae migrans in human (8). This study showed that there is a high rate of infection among these dogs. There is no any previous comparable study in Falluja city, but (9) found that (25%) of 55 were infected with this parasite in Mosul area. (10) however, found that 2 out of 3 dogs were infected and (11) found that 19 (43%) of 44 dogs were infected in the same city. The discrepancy in the rate of infection in these reports and the present work could probably be related to the population of the dogs in this area and the method used for the recovery of this parasite. *Ancylostoma caninum* plays a role too in coetaneous larvae migrans in human (8).only 4 dogs (11%) were infected with this parasite.

Tapeworms, on the other hand from a threat to human health, particularly *Echinococcus granulosus*. However the dogs shot on the outskirts of Falluja city (28 dogs) were free from this parasite. This is possibly due to the fact that they were fed the leftovers of people food. Forty percent of the rest of 19 dogs were infected. This is a very high rate of infection. This is possibly due that there is not hygienic abattoir in this cit yet a moment. It is evident that the parasite is still a threat to human health (8). Other cestodes have also been reported. Their importance has discussed elsewhere (11).

Babesia canis is a common blood parasite that has been reported by others (12 and 11). Four dogs were infected with *Sarcocystis spp*.

Ectoparasites play a major role in role in the transmission of many parasitic, bacterial and viral diseases. Several species of Ectoparasites have been reported previously in dogs such as tick, lice and fleas (13, 14, 15, 12 and 119).

It is therefore, necessary to control the population of these stray dogs in order to containment and prevent their threat to human health.

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