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Prevalence of *Toxocara canis* in Stray Dogs of Kashmir Valley.

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ABSTRACT

Toxocara canis which is a common nematode parasite of dogs is cosmopolitan in distribution and is one of the most important canine parasites because of its widespread distribution, parental and neonatal transmission to pups and public health importance. The prevalence of *Toxocara canis* infection in stray dogs was determined by examining faecal deposits from the pavement of different districts of Kashmir Valley. Out of 968 faecal samples, 188 faecal samples collected from different areas like playgrounds, streets, parks, open fields etc of Kashmir valley were found harbourig *Toxocara canis* eggs. The presence of the source of infection in vicinity like play grounds, house yards, in schools or in open fields poses a great threat and an easy target of human toxocariasis. Public health risk of *Toxocara canis* in human toxocariasis is discussed.

INTRODUCTION

Toxocara canis and *Toxocara cati*, roundworms of dogs and cats are probably the most common gastrointestinal helminthes of domestic canids and felids. First described in late seventeenth century *Toxocara* has been found to infect dogs, cats and mice. The larvae of *Toxocara canis* have been reported in different organs like intestine, liver, lungs, kidneys, skeletal muscles and nervous tissue of rat and mice (Taylor and Holland, 2001). The prevalence of the infection throughout the world shows different infection rates of *Toxocara canis* in dogs; it is 18.3% in Italy (Legrottaglie *et al*., 2003), 25.7% in France (France *et al*., 1997); 18.3% in Indiana (Kazacos, 1978). Saeki *et al*. (1997) found a prevalence of 79.9% of *Toxocara canis* in puppies of stray dogs in Ibaraki Prefecture. D'Souza (2002) reported 2.7% -28% of prevalence of *Toxocara canis* in Bangalore (India). The prevalence of patent *Toxocara canis* infection is highest in young dogs and much less common in adult animals.

Man acts as an unnatural host in which *Toxocara* larvae will not develop but migrate and survive for a long time. The mode of transmission to humans is by oral ingestion of infective *Toxocara* eggs from contaminated soil (sapro-zoonoses), unwashed hands or consumption of raw vegetables (Glickman *et al*., 1981). Human and other animal species may act as paratenic hosts and become infected by accidental ingestion of embryonated eggs. As the population of dogs is growing and expanding. Therefore the zoonotic risks of faeces – borne parasites are of particular interest for both urban and rural areas especially in dense populated areas where the interaction between people and dogs can be more frequent. High population density of infected dogs may result in significant accumulation of *T. canis* eggs in the environment, which could pose a potential risk to both human and animal health. The aim of the present study is to report the prevalence of *Toxocara canis* infection in stray dogs by examination of faecal deposits collected from different areas of Kashmir valley.

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MATERIAL AND METHODS

Source of samples

Between 1st January 2004 to 31st December 2006, 968 faecal samples were examined for the presence of eggs of *Toxocara canis*. All faecal samples were obtained from stray dogs of different districts. Both fresh as well as dried faecal samples were collected. The faecal samples were then kept in 5% formaline in plastic tubes until further treatment.

Parasitological procedure

Both fresh as well as dried out samples were analysed first by the direct smear method and then by the floatation method using a Zinc Sulphate and saturated sodium chloride solutions. Using a research microscope the faecal samples were carefully examined first using the 10X objective and then under 45X objective, field by field covering the entire coverslip. The eggs were identified by their morphological characteristics.

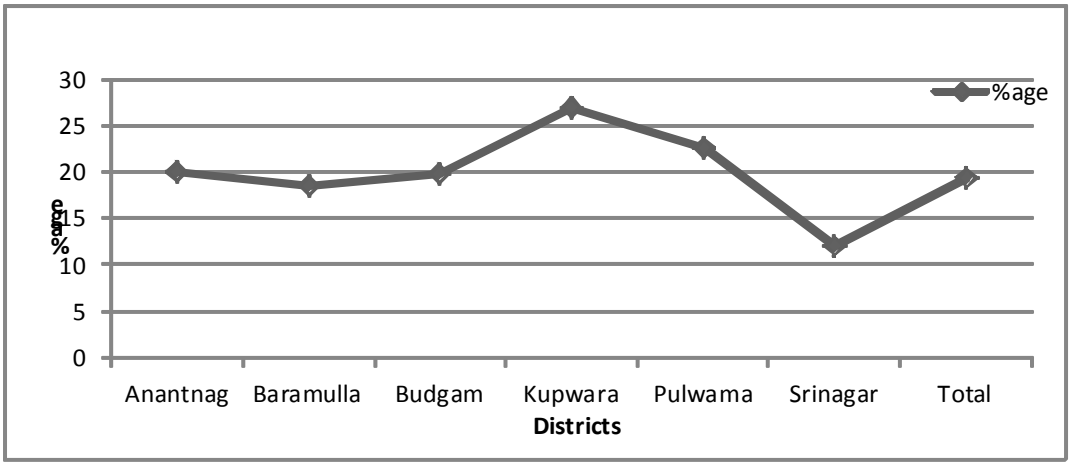
RESULTS

A total number of 968 dog faecal samples were collected. Out of 968 faecal samples, 188 faecal samples collected from different areas like play grounds, streets, parks and open fields of Kashmir valley were found harbouring Toxocara canis eggs. Out of 188 positive faecal samples, the highest prevalence of infection was found in district Pulwama (36/132, 27%), followed by district Kupwara (30/132, 22.72%), followed by district Anantnang (32/160 20%), followed by district Budgam (32/162, 19.75%), followed by district Baramulla (34/184, 18.47%) and the lowest number of infection was found in district Srinagar (24/198, 12.12%). The overall infection rate in dogs of Kashmir valley was 19.42% (Table1).

Table 1: Prevalence of *Toxocara canis* infection in stray dogs of Kashmir Valley

S.No.	District	Total	Positive	Negative	%age
1	Anantnag	160	32	128	20
2	Baramulla	184	34	150	18.47
3	Budgam	162	32	130	19.75
4	Pulwama	132	36	96	27
5	Kupwara	132	30	102	22.72
6	Srinagar	198	24	174	12.12
7	Total	968	188	780	19.42

Fig. 1: Prevalence of *Toxocara canis* infection in stray dogs of Kashmir Valley



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DISCUSSION

The total prevalence of *Toxocara canis* infection in dogs of the six districts of Kashmir Valley was 19.42% which is in general agreement with other studies conducted in different parts of the world. Coggins (1998) reported 21.4% of prevalence of *Toxocara canis* infection in dogs of Wisconsin, Humane society (WHS). Kazacos (1978) in Indiana reported 18.3% of examined dogs were infected with *Toxocara canis* infection, similarly other studies which are in agreement with the present study are Legrottaglae *et al.* (2003), Rubel *et al.* (2003), Shimalov (2002), France *et al.* (1997), Kucharova (1989).

As we know that this parasite is well known by its transmission model, the transplacental migration to the definitive host, the puppy. Prevalence of infection is very high in puppies and decrease with the age of the host. Therefore it is possible that the percentage of *Toxocara canis* infection in stray dogs from different areas may vary, depending upon the accuracy of the faecal samples collected from the pups and adults. As Saeki *et al.* (1997) has reported a prevalence of 79.9% of *Toxocara canis* infection in stray puppies of Ibaraki Prefecture. Similarly Itoh *et al.* (1997) reported 4.3% of dogs positive for the eggs of *T. canis*. The prevalence of *Toxocara* infection in dog population however varies widely (Table 2).

Table 2: Prevalence of *Toxocara canis* in dogs of different parts of the world

S. No.	Country	Prevalence (%)	Year	Authors
1	Venezuela	11.4	2004	Barrios *et al.*
2	India (Maharashtra)	56.8	1977	Joshi *et al.*
3	Poland I) Country dogs II) City dogs III) Animal Asylums	 30.95 22.22 17.01	2004	Ramisz *et al.*
4	Argentina(Chubut)	8.8	2003	Thevenet *et al.*
5	Czech Republic	9.5	2003	Borkovcova
6	Israel	7	1984	Gross *et al.*
7	Argentina(Aires)	11	2006	Fontanarrosa
8	Nova Scotia	26.6	1978	Malloy and Embil
9	Pakistan(Punjab)	33.33	1998	Maqbool *et al,*

It was found that the prevalence of *Toxocara canis* infection in dogs was almost similar in different districts, exception being district Srinagar where it was only 12.12% (fig. 2). The reason behind this may be the less environmental contamination by *Toxocara* eggs, due to less number of dog populations in this district, as Veterinary unit of municipal department has launched a programme of male dog sterlisation in 2004, which in turn decrease the population of dogs in Srinagar. Due to small number of dog population in Srinagar, there is less environmental load of *Toxocara* eggs in soil, thus decreasing the chances of reinfection in dogs and hence overall prevalence of *Toxocara canis* in dogs. The second reason behind it may be safe disposal of the waste substances and the faecal matter of dogs by the municipal department of Srinagar, from the streets, play grounds and parks, making dogs less susceptible to the infection.

To sum up it can be concluded that the presence of the source of infection in vicinity like play grounds, house yards, in schools or in open fields poses a great threat and an easy target of human toxocariasis) in children population of Kashmir valley as reported by Dar *et al*. (2008) and Fomda *et al*. (2007. Gawor and Borecka (2004), D'souza *et al.* (2002) also consider the highest level of soil contamination as a potential risk of toxocariasis for humans. Similarly according to Sturchelir and Peter (1981) lack of education about personal hygiene is an important factor in determining the prevalence of toxocariasis in humans.

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