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PREVALENCE OF *TOXOCARA CANIS* INFECTION IN DOGS AND ITS EFFECTS ON VARIOUS BLOOD PARAMETERS IN LAHORE (PAKISTAN)

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ABSTRACT

The present study was conducted to find out the prevalence of *Toxocara canis* in Lahore, Pakistan and its effect on hemogram in dogs. For this purpose a total of 200 fecal and blood samples from dogs (n=100 stray dogs, n=100 pet dogs) were collected and examined. The results revealed the prevalence of *Toxocara canis* as 49% and 30% in stray and pet dogs, respectively. A significant decrease was recorded in hemoglobin level, packed cell volume and total erythrocyte count where as values were on higher side for total leukocytes count and erythrocyte sedimentation rate in dogs infected with *Toxocara canis.*

Keywords: *Toxocara canis*, hemogram, Lahore, erythrocytes, stray dogs

INTRODUCTION

Toxocara canis (T. canis) is one of the most common parasites living in the intestine of domestic and stray dogs. Major hosts of *T. canis* are dogs and foxes. Adult parasites live in the small intestine of the hosts, producing a prodigious number of eggs that are passed with the faeces (Roberts and Janovy, 1996). Heavy infections in young pups may cause nervous signs and death, (Urquhart *et al.* 1996). A dog excretes thousands of eggs into the environment that are potential source for human infection (Daryani *et al.* 2008). *Toxocara canis* causes visceral, ocular, covert, and common toxocariasis in humans (Overgaauw, 1997 and Magnaval *et al.* 2001).

There are different ways of transmission of toxocariasis depending upon the age and management of dogs. On ingestion, eggs hatch in small intestine and second stage larvae come out. The larvae penetrate intestinal wall and through blood circulation travel to the liver and lungs from they are coughed, swallowed and finally enters into the small intestine where they mature (Urquhart *et al.* 1996). Man gets infection by eating food contaminated with Toxocara eggs such as unwashed vegetables and fruits. Keeping in view the importance of *T. canis* infection its relation to human health, the present study was designed to determine the prevalence of *T. canis* in Lahore and its effect on various blood parameters in dogs.

MATERIALS AND METHODS

Sample Collection: Fecal samples were collected from 200 dogs (n=100 stray dogs, n=100 pet dogs) of either sex. Both stray and pet dogs were further categorized as of 100 pups (n=50 stray, n=50 pets) of less then 6 months of age and 100 adult dogs (n=100 stray, n=100 pets) of more than 6 months of age.

Fecal samples were collected directly from the rectum of each dog with the help of finger using plastic gloves, stored refrigerated and processed within 2-3 hours of collection. The samples were processed using direct smear method, sedimentation method and salt floatation technique as described by Urquhart e*t al.* (1996). Identification of parasites was made according to the morphological characteristics and key as outlined by Soulsby (1982).

Preservation of Nematodes and preparation of mounts: Nematodes recovered were preserved, cleared and prepared for whole mounts by glycerol method as described by Chowdhary and Shad (1972).

Hematological studies: Blood sample (5ml) from each dog was collected in a screw capped sterile test tube containing EDTA @ 1.5mg/ml of blood . Hemoglobin (grams/dl) was estimated by Sahli's method as recommended by Benjamin (1978). Packed cell volume (percent value of packed cells) was determined using Wintrobe's method as described by Coles (1986). Erythorcytic count and total leukocytic was determined according to the method described by Benjamin (1978). Erythrocyte sedimentation rate and differential Leukocytic count was made by hematocrit tube method and on blood films stained by Giemsa staining method, respectively (Schalm *et al.* 1986).

The data thus collected were statistically analyzed by using 't' test (Steel *et al*., 1997).

RESULTS AND DISCUSSION

Prevalence: An overall prevalence of *T. canis* infection in stray dogs was 49%, while it was 38% (19) and 60 % (30) in pups and adults stray dogs, respectively. Similarly, out of 100 pet dogs 30 were found positive for *T. canis* infection. Prevalence of *T. canis* infection in pups and adult pet dogs was ported to be apparently low in both pups and adults which was 38% (19) and 22% (11), respectively. A prevalence of *T. canis* in dogs at 37%, 20.78%, 8%, 20%, 7.3% and 9.7% has been reported, respectively by Hauslinger *et al.* (1993), Doganay and Oge (1993), Shwe (1993), Paunovic *et al.* (1994), Saito *et al.* (1995) and Jani *et al.* (1995).

In stray dogs the prevalence of *T .canis* was 49%, which is in accordance with the observations of Asato *et al.* (1985), Valladares *et al.* (1985), Ugochukwu and Ejimada (1985), Doganay and Oge (1993) and Jani *et al.* (1995), who described the prevalence ranging between 6.5 to 93% in stray dogs. Overall infections of *T. canis* in pet dogs were 30%. Reports with a little lower prevalence in pet dogs were published by various workers Saito *et al.* (1995) and Jani *et al.*, (1995). The higher incidence recorded in the present study may be due to the factors like geographic and climatic conditions of country, poor management practices and frequent mixing of pets with stray dogs which might have the infections. While a high percentage in pups of both stray and pet dogs may be due to parental and neonatal infections, lack of immunity and high susceptibility to toxocariasis.

Table 1. Average values of various blood parameters of healthy and *Toxocara canis* infected dogs in Lahore

Blood Parameters	Average value	
	Infested dog	Normal dogs
Hemoglobin (%)	8.5[a]	15[b]
Erythrocyte Sedimentation Rate (mm/hour)	40[a]	18[b]
Packed Cell Volume (%)	30[a]	45[b]
Total Erythrocyte Count (10^6/ul)	4.5[a]	6.8[b]
Total Leukocyte Count (10^3/ul)	22.1[a]	11.5[b]

*Values with different superscripts for each parameter differ significantly from each other in rows ($p<0.01$).

Hematology: Blood parameters of dogs are shown in table-1. A considerable decrease in hemoglobin level, packed cell volume, total erythrocyte count of dogs infected with *T.canis* was observed, while erythrocyte sedimentation rate was significantly high in infected dogs. The values of blood parameters in healthy dogs remained in normal range. The results of present study are in conformity with those of Deger *et al.* (1997) who reported similar findings.

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