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


Head Quarter Military Farms Group Okara,
*Department of Pathology, **Department of Clinical Medicine and Surgery, University of Veterinary and Animal Sciences, Lahore-Pakistan
Corresponding author email: ziyakh@gmail.com

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 whereas 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 where 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 et 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). Erythrocytic 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 reported 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), Daryani, A., M. Sharir, A. Amouei, F. Askarian, H. Ziaei, S.H. Gohardehi and R. Bastani (2008) Prevalence of *Toxocara canis* in Stray Dogs in Northern Iran. Intl. J. Infect. Dis., 12(1): pp 379.

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

<table>
<thead>
<tr>
<th>Blood Parameters</th>
<th>Average value</th>
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<tbody>
<tr>
<td></td>
<td>Infested dog</td>
</tr>
<tr>
<td>Hemoglobin (%)</td>
<td>8.5&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Erythrocyte Sedimentation Rate (mm/hour)</td>
<td>40&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Packed Cell Volume (%)</td>
<td>30&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Total Erythrocyte Count (10&lt;sup&gt;6&lt;/sup&gt;/ul)</td>
<td>4.5&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Total Leukocyte Count (10&lt;sup&gt;3&lt;/sup&gt;/ul)</td>
<td>22.1&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>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.

REFERENCES


