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Epidemiological aspects of Visceral Larva Migrans in children living at São Remo Community, São Paulo (SP), Brazil

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Abstract

In preparation for a study of risk factors for Visceral Larva Migrans of children living in São Remo Community, São Paulo (SP), Brazil, fecal samples were collected from 41 dogs younger than one year of age, 338 serum samples from children ages 1–15 years and 37 soil samples, during March–June 2001. Fecal and soil samples were examined for the presence of *Toxocara* spp. eggs and serum samples were evaluated by ELISA for antibodies to *Toxocara canis*. Of the fecal, serum and soil samples tested, 39.0%, 26.9% and 29.7%, respectively, were positive, suggesting the possibility of the presence of Visceral Larva Migrans in children.

Keywords: Dogs; Zoonoses; Parasitic diseases; Epidemiology; Public health; *Toxocara* spp.; Children

1. Introduction

Visceral Larva Migrans (VLM) is a parasitic disease of humans caused by infection of *Toxocara* spp. from animals. Although it is not a frequent cause of human death, it causes economic loss through morbidity, reduction of productivity and expenses associated with diagnosis and treatment. Therefore, it is considered one of the most important parasitic zoonosis (Schantz, 1991).

Intestinal parasite of the dog, *Toxocara canis*, and cat, *T. cati*, are most frequently cited as causing VLM, probably due to the popularity of these pets and their close association with humans (Glickman and Magnaval, 1993).

Muradian and Pinheiro (1998) studied 57 dogs and cats involved in an animal birth control program at São Remo community, São Paulo city, Brazil; most (57.9%) were younger than one year of age. About 40% of studied females had already been pregnant at least once and of these, 53.3% had between 2 and 12 offspring. As activation of larvae during pregnancy is an important source of environmental contamination with *Toxocara* spp. eggs, dog population control is

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important for preventing transmission of *T. canis* to humans.

The goal of this study was to investigate epidemiological aspects of VLM in children from São Remo community, São Paulo (SP), Brazil, by examing feces from young dogs, blood from children, and soil for the prevalence of *Toxocara* spp. infection or contamination.

2. Materials and methods

Data were collected between October 2000 and June 2001 in São Remo community, São Paulo city, SP, Brazil. A human and canine census was first conducted using a house to house survey of the entire community. The number of samples to be collected was established using Epi Info 6.0 software assuming a 50% infection rate with a 95% confidence level.

Fecal samples were refrigerated until examination using the method of Willis (1927) and water ether centrifugation–flotation (Ferreira et al., 1962).

Children between one and fifteen years old were identified for study using simple random selection and data collected from the census. A sample of 301 children was targeted based on a seroprevalence of *Toxocara* spp. infection of 50% and a confidence level of 95%. Blood was collected from 338 children after parental permission and their supervision. Blood samples were centrifuged to separate the serum and conserved at −70 °C until testing. The presence of anti-*T. canis* antibodies was evaluated by ELISA using secretion–excretion antigens as described by Camargo et al. (1992).

Thirty-seven soil samples were collected (eight from sand pits, 13 from sidewalks, seven from debris, three from home yards, three from playground and three from the community vegetable garden). These samples were tested for the presence of *Toxocara* spp. eggs by the centrifugation–flotation method (Dada, 1979; Ybanez et al., 2000).

All data were statistically analyzed using Pearson's Chi-square test, with SPSS 9.0. A value $p < 0.05$ was considered to be statistically significant.

3. Results

Of the dogs in São Remo most were kept indoors or outdoors, with only a few stray dogs observed. The majority of dogs remained at least part of the day in the front yard and at other times were allowed inside the house. However, owners allowed their dogs to go out into the streets alone, even if for a few minutes, to urinate or defecate.

The census covered about 95% of all homes; 875 homes were identified containing 3912 people (4.5 hab/home) of which 1381 (35.0%) were children between 1 and 15 years old. In these 1381 homes we found 458 pets; 313 were dogs and 145 were cats (dog: human ratio 1:12.5). Of the dogs, 27.2% (85) were younger than one year of age and 60% (51) were males. These young dogs lived in 71 (8.1%) of all homes. Of the 85 dogs (<1-year old) 55.3% had been dewormed at least once in their lives and, of these, 36.2% had been dewormed more than once. When considering dogs of all ages, about 50% had been dewormed at least once in their lives.

Fecal exams of dogs ($n = 41$) showed 16 (39%) positive for *Toxocara* spp., 16 (39%) for *Ancylostoma* spp.; 8 (20%) for *Giardia* sp.; 3 (7%) for *Trichuris* sp.;

Table 1
Faecal exam results: number (%) of positive by age of dogs in São Remo community, São Paulo (SP), Brazil

Parasite	Age of dogs (months)			Total
	Up to 4 ($n = 5$)	5–7 ($n = 11$)	8–10 ($n = 25$)	($n = 41$)
Toxocara spp.	4 (80)	6 (54)	6 (24)	16 (39)
Ancylostoma spp.	–	5 (45)	11 (44)	16 (39)
Giardia sp.	1 (20)	3 (27)	4 (16)	8 (20)
Trichuris sp.	–	–	3 (12)	3 (7)
Sarcocystis spp.	–	–	2 (8)	2 (5)
Cystoisospora spp.	–	–	1 (4)	1 (2)
Negative	1 (20)	2 (18)	7 (28)	10 (24)

n = number of samples.