

OCCURRENCE OF *Toxoplasma gondii* ANTIBODIES IN SERA FROM DOGS OF THE URBAN AND RURAL AREAS FROM BRAZIL

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ABSTRACT.- SOUZA S.L.P DE, GENNARI S.M., YAI L.E.O., D'AURIA S.R.N., CARDOSO S.M.S., GUIMARÃES JÚNIOR J.S., DUBEY J.P. **Occurrence of *Toxoplasma gondii* antibodies in sera from dogs of the urban and rural areas from Brazil.** [Ocorrência de anticorpos anti-*Toxoplasma gondii* no soro de cães de áreas urbanas e rurais do Brasil.] *Revista Brasileira de Parasitologia Veterinária* v. 12, n. 1, p. 1-3, 2003. Depto de Medicina Veterinária Preventiva e Saúde Animal, Faculdade de Medicina Veterinária e Zootecnia, Universidade de São Paulo, Av. Prof. Orlando Marques de Paiva 87, Cidade Universitária, 05508-000, Brazil. E-mail: sgennari@usp.br

Antibodies to *Toxoplasma gondii* were detected in serum samples of 1244 dogs from urban and rural areas of Brazil. The rural (n=134) dogs were from the northern region of Paraná State and the urban (n=1110) were from the city of São Paulo, S.P. The urban dogs were from two different origins, stray dogs (n=610) and owned dogs (n=500). The samples were analyzed by the modified agglutination test (MAT), using a cut-off value of 1:25. Antibodies were found in 21.3% (265 of 1244 dogs). The occurrence in the rural and urban dogs was 34.3% (46 of 134 dogs) and 19.7% (219 of 1110 dogs), respectively. Among the urban dogs, 31.6% (193) of 610 stray dogs, and 5.2% (26) of 500 owned dogs had antibodies to *T. gondii*.

KEY WORDS: *Toxoplasma gondii*; Antibodies; Modified agglutination test; Brazil.

RESUMO

Amostras de soro de 1244 cães provenientes de áreas urbana e rural do Brasil foram examinadas para a presença de anticorpos anti-*Toxoplasma gondii*. Os cães rurais (134) foram provenientes da região Norte do Estado do Paraná e os urbanos (1110) da cidade de São Paulo, S.P. Os cães urbanos foram de duas diferentes origens, cães não domiciliados (610) e domiciliados (500). As amostras foram analisadas pelo teste de aglutinação modificada (MAT) adotando-se como ponto de corte 1:25. Anticorpos anti-*T. gondii* foram

encontrados em 21,3% (265 dos 1244 cães). A ocorrência nos cães rurais e urbanos foi 34,3% (46 dos 134 cães) e 19,7% (219 dos 1110 cães) respectivamente. Entre os cães urbanos, 31,6% (193) dos 610 cães não domiciliados e 5,2% (26) dos 500 cães domiciliados apresentaram anticorpos anti-*T. gondii*.

PALAVRAS-CHAVE: *Toxoplasma gondii*, Anticorpos, Teste de aglutinação modificada, Brasil.

INTRODUCTION

Seroprevalence of *Toxoplasma gondii* in humans in Brazil is generally very high (DUBEY; BEATTIE, 1988). São Paulo city is a big metropolitan area with an estimated population of about 20 millions. Although cats are the only known host that can excrete the environmentally-resistant oocysts, dogs were identified as a potential risk factor for *T. gondii* infection in humans in Panama (FRENKEL et al., 1995). It has been proposed that dogs may rollover in infected cat feces and children may become infected by licking or patting the dog (FRENKEL; PARKER, 1996; LINDSAY et al., 1997). If this is true, then dogs themselves may become infected by licking infected canine fur or cat feces (LINDSAY et al., 1997).

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Recently, antibodies to *T. gondii* were found in 26.7% of 430 domestic cats from the city of São Paulo (SILVA et al., 2002).

Public health considerations have recently prompted a number of studies on toxoplasmosis particularly in those animal species that have been in close contact with humans for centuries. The objective of the present study was to determinate the occurrence of *T. gondii* antibodies in dogs from rural and urban areas of Brazil and to evaluate the differences between owned and stray urban dogs.

MATERIALS AND METHODS

In total serum samples from 1244 dogs were examined for *T. gondii* antibodies. Of these, 134 dogs were from 22 dairy cattle farms in the northern region of Paraná State (SOUZA et al., 2002). The remaining 1110 dogs were from the city of São Paulo. From those 500 were owned dogs and 610 had been captured from the streets by Center for Zoonosis Control of São Paulo city (GENNARI et al., 2002). Blood samples were collected from each animal, and sera were stored at -20 °C until serologic analysis.

Sera were tested for *T. gondii* antibodies by the modified agglutination test (MAT) using formalin-fixed whole tachyzoites and 2-mercapthoethanol to destroy IgM and non specific reactions as previously described (DUBEY; DESMONTES, 1987). Sera were screened using 1:25 dilution, and the positives were tested in two more dilutions 1:50 and 1:500. A titer of $\geq 1:25$ was considered indicative of past *T. gondii* infection. Positive and negative controls were included in each test.

Serum were analyzed at the Animal Parasitic Diseases Laboratory, USDA, Beltsville, Maryland, and at the Departamento de Medicina Veterinária Preventiva e Saúde Animal, Faculdade de Medicina Veterinária e Zootecnia, USP, São Paulo.

RESULTS

Antibodies to *T. gondii* were found in 265 (21.3%) of 1244 dogs. With respect to origin, antibodies were found in 219 (19.7%) of 1110 urban dogs, 26 (5.2%) of 500 owned dogs, and 193 (31.6%) of 610 stray dogs. From the rural area, 46 of 134 (34.3%) dogs had antibodies to *T. gondii* (Table 1).

Table 1. *Toxoplasma gondii* antibodies in sera of dogs from urban (owned and stray) and rural area from Brazil.

Group	Nº of dogs	Nº of seropositives (≥ 1:25)	% Positive	Antibody titers		
				25	50	500
Urban owned dogs ^a	500	26	5.2	20	06	0
Urban stray dogs ^a	610	193	31.6	96	91	06
Rural dogs ^b	134	46	34.3	28	17	1
Total	1244	265	21.3	144	114	7

^a from city of São Paulo, SP

^b from the northern region of Paraná State

DISCUSSION

It is difficult to compare results of the present study with others surveys in dogs from Brazil because of the sample size, period of survey, type of serologic test used, cut-off value for serology, and type of dog population.

Results of this study indicate that 21.3% of the dogs were exposed to infection to *T. gondii*. Dogs generally become infected with *T. gondii* by ingesting infected uncooked or undercooked meat containing tissues cysts or food and water contaminated with oocysts. Then, infection within the canine population means that the involved area represents an ecological niche for the parasite and a potential transmission risk for humans (GERMANO et al., 1985; JACKSON et al., 1987; CABRAL et al., 1998). The low occurrence of *T. gondii* in owned dogs is of interest indicating that only a small proportion of dogs in homes in São Paulo had been exposed to either oocysts or infected meat. The higher occurrence of *T. gondii* in rural farm dogs and stray dogs reflects more opportunities to ingest tissues of animals or oocysts from the environment.

Svoboda and Svobodová (1987) reported that *T. gondii* antibodies were significantly less frequently in dogs kept in apartments and fed exclusively heat-treated food, and results of the present study support these conclusions.

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