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PREVALENCE OF ANTI- *Toxocara* ANTIBODIES IN A RANDOM SAMPLE OF INPATIENTS AT A CHILDREN'S HOSPITAL IN VITÓRIA, ESPÍRITO SANTO, BRAZIL

Sandra F. MOREIRA-SILVA (1), Maria E. LEÃO (1), Haydée F.S. MENDONÇA (1) & Fausto E.L. PEREIRA (2)

SUMMARY

In the streets of Vitória, in the State of Espírito Santo, Brazil, are large number of stray dogs, many of which are infected with *Toxocara canis*, suggesting a high risk for human infection. In order to investigate the prevalence of *Toxocara* infection in children in Espírito Santo we studied the prevalence of anti-*Toxocara* antibodies in 100 random inpatients over one year of age, at the Children's Hospital N.S. da Glória, the reference children's hospital for the State.All the sera were collected during the period between October 1996 and January 1997. The mean age was 6.6±4.1 yrs. (1 to 14 yrs., median 6yrs.) and there were patients from all of the different wards of the hospital. Sixty-eigth patients came from the metropolitan area of Vitória and the other 32 from 17 other municipalities. The anti-*Toxocara* antibodies were investigated by ELISA-IgG using a secretory-excretory antigen obtained from second stage larvae. All sera were adsorbed with *Ascaris suum* antigen before the test. Thirty-nine sera (39%) were positive, predominantly from boys, but the gender difference was not statistically significant (boys:25/56 or 44.6%; girls:14/44 or 31.8%; p=0.311). The prevalence of positive sera was higher, but not statistically significant, in children from the urban periphery of metropolitan Vitória (formed by the cities of Vitória, Cariacica, Vila Velha, Serra and Viana) than in children from 17 other municipalities (44.1% and 28.1% respectively, p=0.190). Although the samples studied do not represent all children living in the State of Espírito Santo, since the Children's Hospital N.S. da Glória admits only patients from the state health system, it is probable that these results indicate a high frequency of *Toxocara* infection in children living in Espírito Santo. Further studies of population samples are necessary to ascertain the prevalence of *Toxocara* infection in our country.

KEYWORDS: Toxocariasis; Toxocara; Larva migrans visceralis; Helminthiasis

There are little reports about *Toxocara* infection in children in Brazil. The only population study in five cities in the State of São Paulo (São Paulo, Campinas, Santos, Marília and Presidente Prudente)[1], showed 3.60% of persons with significant levels of anti-*Toxocara* antibodies. In this study the prevalence of anti-*Toxocara* antibodies was greater in subjects under fifteen years of age (from 13.04% in Santos to 2.8% in São Paulo and Campinas).

Other investigations into the prevalence of anti-*Toxocara* antibodies in Brazil were done in children with eosinophilia. In Recife, VIRGINIA et al. (1991)[6] found 21 children with positive serology for *Toxocara* (38.9%) among 54 children with eosinophil count higher than 740 cells/mm^3. In Campo Grande, MS, similar results were reported by MATOS et al. (1997)[4] indicating positive serology (ELISA, *Toxocara* secretory-excretory antigen) in 35.5% of 45 children with eosinophil counts equal to or higher than 1000 cells/mm^3.

Toxocara canis is frequently found in dogs captured in the streets of poor areas in the urban periphery of metropolitan Vitória, but the prevalence of *Toxocara* infection in children living in the State of Espírito Santo is not known[5].

The paucity of information regarding *Toxocara* infection in children in Brazil and the high frequency of dogs infected with *Toxocara canis* observed in Vitória led us to investigate the prevalence of anti-*Toxocara* antibodies in a random sample of inpatients at the Children's Hospital N.S. Glória in Vitória.

The Children's Hospital N.S. Glória, located in Vitória, is a reference children's hospital for the State of Espírito Santo, which admits almost all the pediatric cases of the public health system.

One hundred serum samples were randomly collected from inpatients admitted in the period between October 1996 and January 1997, with the only exclusion criterion being age under one year. During this period 1141 children were admitted and the serum samples were collected twice a week (one serum sample in each of

(1) Hospital Infantil N.S. da Glória, Vitória, ES, Brasil
(2) Núcleo de Doenças Infecciosas. Centro Biomédico. UFES.Vitória, ES,Brasil
Correspondence to: Fausto E.L. Pereira, Núcleo de Doenças Infecciosas. Centro Biomédico/UFES, Avenida Marechal Campos 1468. 29040-091 Vitória, ES, Brazil.

the 10 wards, from a patient admitted the previous day). The sera were stored at -70 °C untill the moment before the test.

The reasons for admission for children in the present study are in Table 1. Fifty-six were male and forty-four female. The mean age was 6.6± 4.1 yrs. (from 1 to 14 yrs., median 6 yrs.). Sixty-eigth cases came from the metropolitan area of Vitória, (formed by the cities of Vitória, the capital of the State, Cariacica, Vila Velha, Serra and Viana) and thirty-two cases came from 17 other municipalities in the State.

Anti-*Toxocara* antibodies were investigated with an immunoenzymatic method (ELISA-IgG), using a *Toxocara* excretory-secretory antigen obtained from second stage cultivated larvae. All sera were submitted to previous adsorption with *Ascaris suum* extract (one hour at 37 °C). All the reactions were done at the Laboratório de Análises e Pesquisas Clínicas G. Fleury (São Paulo,SP), and according standardization of this laboratory results are considered positive for any sera with titres over 500.

Thirty nine out of 100 serum samples (39%) contained anti-*Toxocara* antibodies of significant levels (titres from 554 to 40438), seven showed titres under 500, and 54 were non-reactive. There was no significant difference in the prevalence of positive serology between boys and girls (boys: 25/56 or 44.6%; girls: 14/44 or 31.8%; p= 0.311). The mean age was similar in the positive and negative groups (7.1 ± 3.8 yr. and 6.7 ± 4.24 yr. respectively). There was no relationship between antibody levels and age (Pearson coefficient **r**= -0.05567, p=0.738).

In the population sample there was a predominance of cases from the metropolitan area of Vitória (68% of cases), but the prevalence of positive serology, although higher in these cases, was not statistically different from that observed in children coming from other cities (30/68 or 44.1% and 9/32 or 28.1% respectively; x^2= 1.72, p=0.190)

The results show a high prevalence of anti-*Toxocara* antibodies in children admitted at the Children's Hospital N.S. Glória in Vitória, considering that there was a random sampling of patients for serum testing. The prevalence observed is similar to that observed in Campo Grande and Recife in children with eosinophilia[4,6].

Our results can not be compared with other population studies nor can they be extrapolated to all children living in Espírito Santo because the results were obtained from inpatients of a pediatric hospital. However this observation seems to indicate a possibly high prevalence of *Toxocara* infection in children in Espírito Santo, mainly in children from the metropolitan area of Vitória. In this investigation, the prevalence of positive serology was higher in children from the urban periphery of metropolitan Vitória, where the canine population is frequently infected with *Toxocara canis*.

This high prevalence of positive serology for *Toxocara* could be the result of cross-reactivity with antigens of other parasites, as demonstrated by LINCH et al.[3]. However, the sera were adsorbed with *Ascaris* antigen, the parasite most frequently found in these children. Other parasites that cross-react with *Toxocara* are not observed (such as *Filaria,* for ex.*)*, or have low frequency in children admitted to Children's Hospital N.S. da Glória as it occurs with *Strongyloides* (unpublished data).

As reported by other investigators[2], our results show a moderate predominance of *Toxocara* infection in boys, although the difference observed was not statistically significant.

The result of this investigation, demonstrating high frequency of *Toxocara* infection among children admitted to a children's hospital in Vitória, strengthen the need for further population studies of the prevalence of this infection in the State of Espírito Santo, especially in the densely populated areas, with many stray dogs, such as metropolitan Vitória.

TABLE 1
Diseases observed in 100 random inpatients, over one year of age, at Children's Hospital N.S. da Glória, in which anti-*Toxocara* antibodies were investigated.

Group of diseases	N
Bacterial infections	27
Neoplasia (including leukemia)	14
Hematological disorders (nonmalignant)	12
Acute viral infections	12
Chronic liver or bile duct diseases	7
Trauma	7
Asthma or other allergies	5
Glomerular diseases	4
AIDS	3
Tuberculosis	2
Schistosomiasis	2
Histoplasmosis	1
Leptospirosis	1
Visceral leishmaniasis	1
Toxoplasmosis	1
Mucoviscidosis	1
Total	100

RESUMO

Prevalência de anticorpos anti-*Toxocara* em amostra não selecionada de crianças internadas em hospital pediátrico em Vitória, Espírito Santo, Brasil

Em Vitória é grande o número de cães soltos nas ruas, muitos dos quais infectados com *Toxocara canis*, sendo alto o risco de infecção humana. Para investigar a prevalência da infecção com *Toxocara* em crianças no Espírito Santo, estudou-se a prevalência de anticorpos anti-*Toxocara* em 100 soros colhidos aleatoriamente de crianças internadas no Hospital Infantil N.S. da Glória, hospital pediátrico de referência para o Estado. Todos os soros foram colhidos no período entre Outubro de 1996 e Janeiro de 1997. A média das idades foi 6,6±4,1 anos (1 a 14 aa., mediana de 6 aa.) e havia pacientes de todas as enfermarias do hospital. Sessenta e oito pacientes eram procedentes da região metropolitana de Vitória e trinta e dois eram originados de 17 outros municípios do Estado. Os anticorpos anti-*Toxocara* foram investigados utilizando-se um teste ELISA-IgG, com antígeno de secreção-excreção. Todos os soros foram adsorvidos com extrato de *Ascaris suum* antes do teste. Trinta e nove soros (39%) foram positivos, com predominância nos meninos, mas a diferença entre os sexos não foi estatisticamente significante (respecticamente 25/54 ou 44,6% nos meninos e 14/44 ou 31,8% nas meninas, p=0,311). A prevalência de soros positivos foi maior, mas não estatísticamente significante, nas crianças procedentes da região metropolitana de Vitória (formada por Vitória, Cariacica, Serra, Vila Velha e Viana) do que nas crianças originadas dos 17 outros municípios do Estado (respectivamente 41,1 e 28,1 %, p=0,190). Ainda que a amostra estudada não seja representativa das crianças que vivem no Estado do Espírito Santo, já que o Hospital Infantil N.S. da Glória atende somente pacientes do Sistema Único de Saúde, os resultados indicam a possibilidade de ser alta a prevalência da infecção com *Toxocara* em crianças que vivem no nosso meio.

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