Epidémiol. santé anim., 1997, 31-32

THE ECOLOGICAL ASPECTS OF EPIDEMIOLOGY OF PET GEOHELMINTHOSES

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The distribution of eggs of pet geohelmints in urban, suburban and rural areas was examined and the role of some environmental factors in the transmission of the infections in Poznañ (Poland) region was studied. Toxocara spp. (10%) and Trichuris vulpis (6%) eggs were recorded and were more numerous in the soil of urban areas than in rural villages. The highest rate of soil contamination was observed in the centre of the city in apartment houses courtyards (61% positive samples). There was no correlation, however, between the proportion of the eggs in the soil samples and dogs' faeces samples. The relationship between soil texture and the number of positive samples was indirect. Under natural conditions earthworms, can carry living geohelminth eggs of pets to the surface of the ground for at least 3 years. Children living in the heavily contaminated area were significantly more infected with Toxocara eggs (8% seropositive children) than those in the control group (2,6% seropositive children).

INTRODUCTION

Pet geohelminthoses are widely spread all over the world (Glickmann 1992). As the source of infection is contaminated soil, the distribution of *Toxocara* spp. and *Trichuris vulpis* eggs in differently populated areas in Poznañ (Poland) region was examined and the role of some environmental factors in transmission of the parasites was studied.

MATERIAL AND METHODS

The city centre, the suburban area, lake beaches and rural villages were sampled. The studies also included sandpits and flowerpot soil and, in areas found to be most heavily contaminated with the eggs, the castings of earthworms and dogs' faeces. All samples were examined for geohelminth eggs by flotation in saturated sodium nitrate solution using Dada's technique (Dada 1979) and its modification. In each area examined grain size composition of the soil was determined using sieving and aerometric techniques. The proportions of gravel (> 2.0 mm), sand (2.0-0.11mm), silt (0.10-0.02 mm) and clay (<0.02 mm) were established.

RESULTS

Of 534 soil samples examined, 89 (17%) contained geohelminth eggs of pets. *Toxocara* spp. eggs were more common (10% positive samples with 130 eggs) than *T. vulpis* (6% positive samples with 116 eggs), although the invasive larvae were found in 86 % of *T. vulpis* eggs and in 53 % of *Toxocara* spp. eggs recovered. The rate of soil contamination in urban area was much higher (24% positive samples) than in rural villages (12% positive samples). Of 54 samples from 14 sandpits, 7% were positive for *Toxocara* spp. and *Trichuris vulpis* eggs and for both invasive larvae were found. The smallest number of samples with eggs were found on lake beaches with 2% samples positive. One *T. vulpis* egg with an invasive larva was identified in the soil taken from 8 flowerpots. In 15 samples (3%) the eggs of both parasites were found. The relationship between soil texture and number of positive samples in the areas examined was indirect (Mizgajska 1997). Under natural conditions earthworms carried living *T. vulpis* and *Toxocara* spp. eggs with the residues to the surface of the ground for at least three years after its contamination. Prevalence of *Toxocara* spp. eggs in soil was over three times higher than in dog's faeces. The number of *T. vulpis* eggs in dog's faeces samples and in soil samples was the some. To assess the exposure of humans to infection, a random group of 513 hospitalised children was examined for *Toxocara* antigen and 2.6% were seropositive. Exposure was higher in a heavily contaminated area in the centre of the city where 8% of children were seropositive (Paw³owski at all. 1996).

CONCLUSIONS

- In Poznañ region the rate of soil contamination with pet geohelminth eggs is over twice higher in urban area than in rural villages and *Toxocara* spp. eggs are more common than *T. vulpis* eggs.
- Earthworms .considerably support transmission of pet geohelminthoses carrying living eggs from deeper layers to the surface of the ground.
- The relationship between soil texture and number of positive samples is indirect.
- Children living in the highly contaminated area were significantly more infected with *Toxocara* than the control group.

BIBLIOGRAPHY

Dada B. J. O. 1979. A new technic for the recovery of *Toxocara* eggs from soil. J. Helminthol. 53, 141-144.

Glickman L. T. 1993. The epidemiology of human toxocariasis in: *Toxocara* and toxocariasis. Clinical, epidemiology and molecular perspectives (Levis J. W. and Maizels R. M. eds.), pp. 3-11, London.

Mizgajska H. 1997. The role of some environmental factors in the contamination of soil with *Toxocara* spp. and other geohelminth eggs. Parasit. Int. 46, 67 - 72.

Paw³owski Z. S., Lesicka U., £u¿na A., Mizgajska H., Stefaniak J., Szewczyk-Kramska B. 1996. Toxocarosis in children in Poznañ region, Poland. Epidemiological and clinical studies. [in Polish]. In: Clinical aspects of selected parasitic infections in man (toxoplasmosis, toxocarosis, giardiosis), pp. 21-23, Warszawa.

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