
A CASE OF INTESTINAL PARASITOSIS DUE TO ANIMAL

HOOKWORM

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SUMMARY

A previously unrecorded Venezuelan infection with *Ancylostoma braziliense* (or *A. ceylanicum*) was discovered in a 20-year-old male originally from Caracas. Main features included pallor, malaise, diarrhea, epigastric ache and pronounced weight loss (13kgs). Close and frequent contact with domestic dogs was noteworthy. Four months earlier patient developed an unspecified skin eruption after a barefoot exposure in a local river. More recently, one month ago, he was hospitalized and treated for intestinal amebiasis. White blood cell count was 28600/mm³ with 51.5% eosinophils. The Baermann test revealed one adult male hookworm with a single pair of teeth in the buccal cap-

sule. Typical hookworm eggs and Charcot-Leyden crystals were found in fecal samples. Oral thiabendazole therapy (25mg/kg/day for 10 days) induced clinical improvement and reduced the white blood cell and eosinophil counts to 8800 cells/mm³ and 11% eosinophils. Definite species identification of *A. braziliense* or *A. ceylanicum* could not be achieved having recovered only one specimen. In other countries, human infection by these species has been reported, mainly with *A. ceylanicum*, both accidentally and experimentally. This parasite, found in human feces, is of a species common to animals.

Case Report

A 20 years old male from Caracas, Venezuela, consulted with a one-month history of watery diarrhea, epigastric stomachache and a significant weight loss (13kg). Initial laboratory: white blood cell count (WBC) of 16000/mm³ with toxic granulation, 4% eosinophils and *Giardia duodenalis* in stool examinations. As his WBC count increased to 20000/mm³ he was hospitalized, suspecting appendicitis. Endoscopy and upper abdominal ecosonogram were unremarkable, and stool re-examination demonstrated *Entamoeba histolytica* cysts. WBC increased to 26000/mm³ with fluctuating eosinophilia (8-58%). Clinical improvement with antibiotics and antiamebics did not abolish all symp-

toms, being referred to the Amebiasis Laboratory, Department of Parasitology, Escuela de Bioanálisis, Facultad de Medicina, Universidad Central de Venezuela. The patient reported remaining mild discomfort, stomach ache and watery diarrhea, and was found pale and moderately ill. Laboratory data showed: hemoglobin 14.2g/dl, hematocrit 41.3%, MCV 90.3, MCH 31.1, MCHC 34.5, WBC 28600/mm³, platelets 395000/mm³, neutrophils 20.5%, lymphocytes 21%, eosinophils 50.5%, basophils 0.5%, monocytes 2.5%. Anisocytosis. Stool examination included direct method, Willis, Baermann, Rugai, Harada-Mori culture and Ziehl-Nielsen for protozoa's. After three days, one mature male specimen of *Ancylostoma* with one pair of teeth in the buccal capsule (Fi-

gures 1a-c) was detected by Baermann's method, followed on next day by Charcot-Leyden crystals and typical hookworms eggs. By the third day of thiabendazole therapy (25mgs/kg/day) clinical improvement was induced, and on the eighth day WBC decreased to 8800/mm³ and eosinophils to 11%.

Discussion

Several species of the *Ancylostoma* genus (*A. caninum*, *A. braziliense* and *A. ceylanicum*) are frequent intestinal invaders of canines and felines. Percutaneous larval entry in humans triggers cutaneous larva migrans (CLM), a tortuous trajectory of pruritic erythematous papules, mostly on upper and lower extremities, erratic migration, and a progression of about 2 to 5 cm/day. It behaves

as a self-limited process that generally disappears with topical therapy (Rey, 2001).

Multinational clinical and epidemiological investigations (New Guinea, Thailand, Malaysia, etc.) revealed invasion and adaptation of *A. ceylanicum* to the human intestine, preceded sometimes by cutaneous lesions (Anten and Zuidema, 1964). Maplestone (1933) inoculated *A. braziliense* to volunteers, inducing intestinal infections preceded by itching papules. Haydon and Bearup (1963) reproduced a similar clinical picture by infecting three people with *A. ceylanicum* larvae derived from a Solomon Islands habitant. As larval inoculation was expanded (Wijers and Smit, 1965), so did information about the clinical spectrum. In the early stages (6h) linear streaks of pruritic

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UN CASO DE PARASITOSIS INTESTINAL OCASIONADO POR ANQUILOSTOMÍDEO DE ANIMALES

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RESUMEN

Se describe un caso, no referido previamente en Venezuela, de infección intestinal por *Ancylostoma braziliense* (o *A. ceylanicum*) en un joven de 20 años de edad procedente de Caracas. Al examen físico presenta: palidez, malestar general, diarrea, epigastralgia, y acentuada pérdida de peso (13kgs). Como antecedente epidemiológico de importancia refiere contacto permanente con perros, presencia de erupción dérmica cuatro meses atrás, posterior a baño en río, y hospitalización un mes antes, siendo tratado por amebiasis intestinal. Laboratorio: Hemoglobina 14,2grs/dl, leucocitos, 28600/mm³, eosinófilos 51,5%. En el examen de heces se identifican huevos de anquilostomídeos y cristales de Charcot-Leyden; mediante el método de Baermann

se detecta un ejemplar de anquilostomídeo adulto, macho, con un solo un par de dientes en la cápsula bucal. Los síntomas mejoraron al ser tratado con tiabendazol (25mgs/kg/día por 10 días) y disminuyeron los valores de los leucocitos y eosinófilos (8800/mm³ y 11%, respectivamente). No fue posible la identificación de la especie del parásito por tratarse de un solo ejemplar. En otros países se han demostrado casos de infección intestinal en humanos producida por estas especies, principalmente por *A. ceylanicum*, de manera accidental y experimental. El parásito encontrado en este paciente, es una especie de anquilostomídeos propio de animales.

UM CASO DE PARASITOSE INTESTINAIS OCASIONADO POR ANCYLOSTOMÍDEO DE ANIMAIS

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RESUMO

Uma infecção humana por *Ancylostoma braziliense* (o *A. ceylanicum*) anteriormente não registrada na Venezuela foi encontrada em um homem de 20 anos de idade procedente de Caracas. As manifestações clínicas eram: aparência pálida, mal-estar, diarreias, dor epigástrica e perda de peso (13kg). Contato estreito e frequente com cães domésticos foi notável. Quatro meses antes, ele desenvolve uma erupção de pele indeterminada após tomar banho em um rio local. Um mês antes foi hospitalização e tratado por amebiasis intestinal. Exames laboratoriais: leucócitos, 28600/mm³ com 51,5% de eosinófilos. O teste de Baermann revelou um ancilostomídeo adulto com um único par de dentes na capsula buccal. Ovos de *Ancylos-*

toma spp. típicos e cristais de Charcot-Leyden foram encontrados em mais exames coproparasitológicos. Terapia com tiabendazol (25mgs/kg/dia por 10 dias) induziu melhora clínica e reduziu as células brancas de sangue e contagem de eosinófilos (8800/mm³ e 11%). Identificação de espécie definitiva de *A. braziliense* o *A. ceylanicum* não se conseguiu chegar em resultados conclusivos. Em outros países tem sido detectados vários casos de infecção intestinal em humanos produzida por estas espécies, principalmente por *A. ceylanicum*, de maneira accidental e experimental. O parasita encontrada em este paciente é uma espécie própria de animais.

papules are common followed during the next 15-20 days by epigastric and abdominal discomfort, headache, fatigue and weakness. Around the fifth week, eggs of *A. braziliense* var. *ceylanicum* become detectable, together with leukocytosis and eosinophilia. Excluding diarrhea, the latter authors emphasize similarities with Brumpt's observations in therapeutic trials using *A. duodenale* in polycythemia and hypertension patients. Not all inoculated volunteers develop dermic lesions but digestive symptoms tend to coincide with marked egg excretion and eosinophilia (Carrol and Grove, 1984a). In agreement with Bearup (1967) they also highlighted the dissociation between onset and intensity of symptoms and the coexisting parasitic load.

The human pathogenesis has had additional corroboration when in multilocalized communities 4% of 788 individuals harbored *A. ceylanicum* (Velásquez and Cabrera, 1968; Yoshida *et al.*, 1968; Chowdhury and Schad, 1972; Bungiro *et al.*, 2003; Jiraanankul *et al.*, 2011; Conlan *et al.*, 2012). In addition, mixed epidemiological animal/human testing supports the contaminating role of animal reservoirs. A single step PCR study (Traub *et al.*, 2008) revealed *A. ceylanicum* and *A. caninum* in dogs, and *N. americanus* and *A. ceylanicum* in humans, strongly suggesting canine-derived human contamination. Contact related zoonosis has been further supported (Mahdy *et al.*, 2012; Ngui *et al.*, 2012a, b) by analysis of animal prevalence in which *A.*

ceylanicum predominated in urban dogs and domestic cats, and *A. caninum* in dogs of rural areas (Scholz *et al.*, 2003; Ngui *et al.*, 2012b).

The patient under study exhibited manifestations of a severe acute intestinal parasitic infection, similar to those induced experimentally, without anemia (Wijers and Smit, 1966; Carrol and Grove, 1984a). Epidemiologically noteworthy, he referred that four months preceding his current illness, after bathing in a river located in a rural area, he developed a poorly described cutaneous reaction, which resolved with steroids. The approximate elapsed time until symptoms ensued differs from the conventional incubation period for hookworms, of 4-5 weeks. However, a dormant state in

muscle tissue (hypobiosis) of *A. caninum* (and other animal parasites) lasting up to 8 months remains possible (Nawalinsky and Schad, 1974; Little *et al.*, 1983; Botero and Restrepo, 2012). Although no previous human invasion by this *Ancylostoma* species has been documented in Venezuela, contamination from frequent domestic canine contacts is the most likely explanation. Retrospectively, the ineffectiveness of antibiotics and antiamebic drugs suggested an unusual infection. Although diarrhea, abdominal symptoms, malaise, weight loss, leukocytosis and eosinophilia are common non-specific manifestations of high parasitic loads, the patient lacked evidence of predisposing immunological deficiencies or malnutrition.

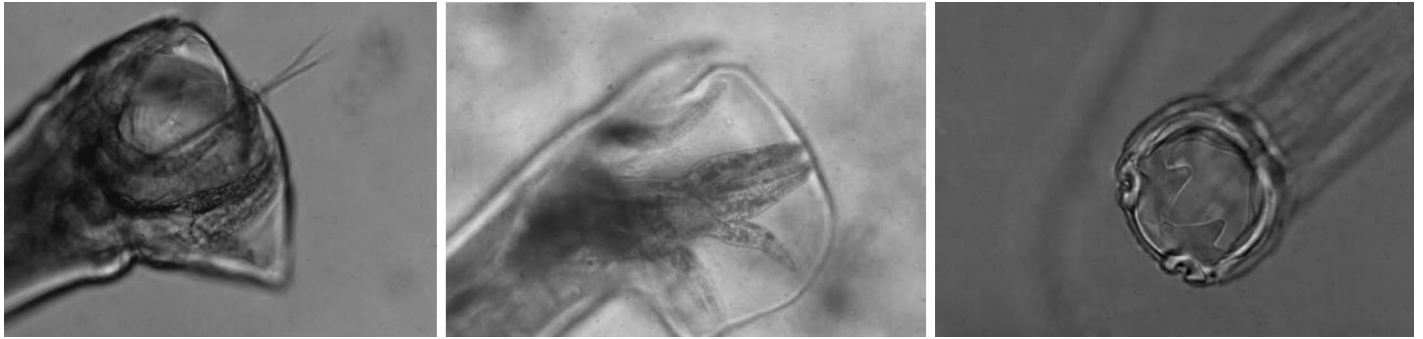


Figure 1. Specimens found in stool. a and b: copulatory bursa with rays and spicules, c: buccal capsule with one pair of teeth.

The teeth visualized in the buccal capsule identified the *Ancylostoma* genus. Both *A. braziliense* and *A. ceylanicum* possess only one pair, but exhibit different morphological characteristics in the buccal capsule and the copulatory bursa (Velásquez and Cabrera, 1968). A sample slide was sent for verification to the Universidade Federal de Minas Gerais, Brazil, but the single available specimen lacked the necessary features to determine the culprit specie.

Accurate quantification of the parasitic load was unattainable. The day following the finding of the parasite, hookworm eggs confirmed the existence of more specimens, but suggested a low load. The patient was treated successfully, but did not provide additional adequate samples. In experiments with dogs, the number of fecal eggs is proportional to the amount of inoculated larvae (Carroll and Grove, 1984b). Possible differences in the clinical features of spontaneous infections and induced larval administration both in humans or animals must be considered. Thus, the present case exemplifies the recognized divergence between clinical severity and extent of parasitic load (Bearup, 1967).

A systematic search for previous reports of this specific specie in human infestations in Venezuela was unsuccessful. In 1904, Rangel described 'Ankilostomiasis in Venezuela' in anemic cases (Rangel, 2006). Much later, compilations carried out in 1957 from the Vargas Hospi-

tal, Caracas, revealed infections by *N. americanus* y *A. duodenale*. Since neither report refers morphological descriptions of the adult parasite's buccal capsule, the species involved remain unknown (Pérez Giménez *et al.*, 1957).

This fortuitous finding should stimulate gastroenterologists, parasitologists and medical technicians to perform detailed evaluations of fecal samples in cases with digestive complaints, leukocytosis and eosinophilia. There is ample proof that cohabitation or contact with untreated pets or domestic animals may induce some human zoonosis. We found in human feces a parasite species common in animals.

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