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A Case of Cutaneous Larva Migrans in a Child from Vinces, Ecuador

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

ADEF 1 Roberto D. Coello
ACDE 2 Betty J. Pazmiño
BCF 1 Enrique O. Reyes
BCF 1 Enrique X. Rodríguez
ACDE 3 Edgar I. Rodas
CDE 3 Karen A. Rodas
BCD 1 Alfredo X. Dávila
BCD 3 Jennifer P. Rodas
CDF 1 Pedro P. Cedeño

1 Department of Teaching, Coordination, and Research, University of Guayaquil, Guayaquil, Ecuador
2 Department of Teaching, Coordination, and Research, State University of Milagro, Milagro, Ecuador
3 Department of Microbiology, Pazmiño Clinical and Microbiological Laboratory, Milagro, Ecuador

Corresponding Author: Betty J. Pazmiño, e-mail: bpazminog@unemi.edu.ec, bettypazmino@hotmail.com
Conflict of interest: None declared

Patient: Male, 8
Final Diagnosis: Cutaneous larva migrans
Symptoms: Acute pain in the foot • itching
Medication: —
Clinical Procedure: Treatment, ivermectin in a single dose of 200 µg/kg
Specialty: General and Internal Medicine

Objective: Rare co-existance of disease or pathology

Background: Cutaneous larva migrans (CLM) is caused by nematode parasites of the hookworm family of Ancylostomatidae. Ancylostomiasis is a zoonosis found in cats and dogs, and humans are an accidental host. This report presents a case of CLM in an 8-year-old boy, which was due to the zoonotic transmission of *Ancylostoma caninum* from domestic dogs in an urban area of Vinces, Ecuador, and demonstrates how awareness and early diagnosis contributed to the timely treatment of CLM.

Case Report: An 8-year-old boy from the urban area of Vinces city in the Los Ríos province of Ecuador presented with a serpiginous palpable lesion on the sole of the right foot, consistent with a diagnosis of cutaneous larva migrans (CLM). He was infected through contact with the soil where canine *Ancylostoma* larvae were found. Twenty samples of feces were analyzed from the soil, and *Ancylostoma* larvae were found in 100% of these samples. Also, 120 dog stool samples were examined, and 75 (62.5%) contained *Ancylostoma* larvae, which were identified using the modified Willis and Baermann method.

Conclusions: CLM is a zoonotic disease that can affect the population in endemic areas. In this case, CLM was identified in the sole of the foot of a child. The presence of *Ancylostoma* larvae were identified in the soil and in the feces of dogs, indicating that the community was exposed to a significant environmental risk from this zoonotic disease.

MeSH Keywords: Ancylostoma • Larva Migrans • Zoonoses

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/915154

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Background

Worldwide, helminthic diseases transmitted through the soil affect more than two billion people [1,2]. Cutaneous larva migrans (CLM) is caused by nematode parasites of the hookworm family of Ancylostomatidae. Ancylostomiasis is a zoonosis found in cats and dogs, and humans are an accidental host. Common forms of Ancylostomiasis include *Ancylostoma caninum* and *Ancylostoma braziliense*. Humans become infected with hookworm when the skin comes into contact with infective larvae found in the feces of cats and dogs [3]. The larva penetrates the dermis and results in a local inflammatory reaction as it migrates through the skin and dermal tissues [3]. In humans, CLM is characterized by the appearance of a single linear, pruritic, and slow-growing lesion that advances at a rate of 1–2 cm per day [4,5].

Infective parasitic forms from dog or cat feces contaminate the environment as they enter the soil of public parks or wasteland, and this represents a serious animal health problem for uninfected dogs or cats, and a public health problem for humans [6]. Ancylostomiasis in domestic dogs is usually asymptomatic or causes intestinal disorders, anorexia, weight loss, and developmental disorders, but in severe cases, it can cause death [7].

The diagnosis of CLM in humans is made clinically and is based on the morphology of the skin lesions and the knowledge of the endemic nature of the condition in countries with a tropical climate. Laboratory tests are usually normal, but eosinophilia may be present. It may be uncommon to detect any pathology caused by the parasite in CLM, because it may be found in places that are not visible [5,8]. Intense pruritus can be associated with a strong inflammatory reaction to hyaluronidases and other enzymes secreted by the larvae as these enzymes facilitate penetration of the skin [9]. Dermatoscopy can be helpful in the clinical diagnosis of CLM but may fail to detect the larvae in some patients.

This report presents a case of CLM in an 8-year-old boy, which was due to the zoonotic transmission of *Ancylostoma caninum* from domestic dogs in an urban area of Vinces, Ecuador, and demonstrates how awareness and early diagnosis contributed to the timely treatment of CLM.

Case Report

Clinical presentation, diagnosis, and treatment

An 8-year-old boy who lived in the urban area of Vinces, Ecuador presented with a two-week history of a pruritic skin lesion on the sole of his right foot, which was initially treated as a presumed fungal infection. On physical examination, a 9 cm serpiginous, erythematous, and palpable plaque was present on the sole of the right foot that was associated with edema (Figure 1).

Figure 1. An 8-year-old boy with a serpiginous palpable lesion on the sole of the right foot, consistent with a diagnosis of cutaneous larva migrans (CLM).

The morphology of the skin lesion and its location were consistent with a diagnosis of cutaneous larva migrans (CLM). On direct questioning about risk factors for hookworm infestation, the child's parents stated that he played football in a vacant lot and sometimes walked barefoot. Also, there were many domestic and feral dogs in the area.

The patient was treated with ivermectin administered as a single dose of 200 µg/kg. Seven days after treatment, the skin lesion on the sole of the right was dry, the child no longer complained of pruritus, and the symptoms had completely resolved during the following week [10,11].

Identification of the source of *Ancylostoma caninum*

Fecal samples from twenty dogs were collected from a vacant lot in La Granja, a central-southern urban area of Vinces, a city in the Los Ríos province of Ecuador. Samples were collected between 11 May and 15 June 2018 and were analyzed by the modified Baermann method. All the samples (100%) were positive for *Ancylostoma caninum* (Figure 2).

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Figure 2. The presence of filariform larvae of Ancylostoma caninum in soil samples.

Figure 3. The identification of an Ancylostoma caninum egg using the Willis technique.

Figure 4. The identification of a filariform larva of Ancylostoma caninum.

The prevalence of *Ancylostoma caninum* in fecal samples from dogs

Residents of the urban area of Vinces, Ecuador were informed about the risks from infestation by parasitic zoonoses and the importance to public health for determining the source of hookworm or *Ancylostoma caninum*. Informed consent of the animal owners was obtained before the dog feces were sampled. Residents were told how to obtain the sample and were supplied with a sterile container and instructions.

Fecal samples of domestic dogs were collected from households that agreed to participate in the study. In cases in which the dog owners could not collect the feces, the sample was taken with all the recommended biosecurity measures for this type of study.

The fecal samples that were obtained and those collected from the ground were transported on the day of collection in refrigerated boxes at 4–8°C to the Microbiology Laboratory of the Faculty of Veterinary Medicine and Zootechnics, University of Guayaquil.

Subsequently, between 29 June and 30 September 2018, 120 domestic and feral dogs in the sector adjacent to the urban lot were examined. Stool samples from the domestic dogs were analyzed using the Willis-Mollay simple flotation technique. In 75 stool samples from the domestic dogs, the presence of *Ancylostoma caninum* was identified (62.5%) using the method described by Willis (Figures 3, 4) [12,13].

Infection control for *Ancylostoma caninum*

Dogs that were infested with Ancylostoma caninum were dewormed using milbemycin oxime and praziquantel in a single dose of 0.5 mg/kg (0.23 mg/lb). After one month, a direct coproparasitic examination and flotation test were used to confirm the absence of the parasite [14]. The disease was also controlled by deworming the child, and health education campaigns were conducted, and the impact of untreated parasitosis was explained. Also, the land was cleaned, and the water was disinfected.

Discussion

This report of a case of cutaneous larva migrans (CLM) in an 8-year-old child is the fourth case reported in Ecuador. Two previously reported cases of CML were reported in a 35-year-old woman and a 28-year-old man, both from Riobamba, who had been infected at the Atacames beach in the Esmeraldas area. In 2017, at the El Aguador Health Center in the city of Machala, a case of CLM in the gluteal region was reported in an 11-year-old girl [28,29].

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CLM is a zoonotic infection from the definitive host in the cat or dog. The feces of these animals contain eggs, which hatch in the ground where the larvae develop. Larvae can be transmitted within a week. Under favorable conditions of a humid environment and protected from light, the larvae can survive and maintain their ability to infect humans for months.

To control the spread of CLM, dogs and cats must be dewormed regularly, and people living in endemic areas of this disease should wear shoes to prevent contamination. However, these preventive measures may be hard to achieve, since this zoonosis is endemic in developing countries, which are generally associated with a lack of veterinary health systems and a large number of parasites can be found in the soil [15]. Although uncommon, cases have been reported from patients with no history of travel to endemic areas [16]. CLM is endemic in tropical and subtropical developing countries that have warm and humid climates and has a worldwide distribution but predominates in Mexico, and in north, central, and south America, Africa, and Southeast Asia. CLM has been reported most frequently in Brazil, India, and Sri Lanka, mainly in areas where there are dogs and cats without owners and in sandy and humid soils, such as beaches and recreational parks.

In this study, the prevalence of *Ancylostoma caninum* was determined in 100% of soil and dog feces samples. However, previous studies in Brazil on the prevalence of this parasite in soil samples in public parks and grounds was 46.8% for the parasitic form of the egg or larvae [17–19]. In Brazil, up to 85% of the soil samples were shown to be positive [17–19]. Also, cases of parasitic forms of Ancylostoma have been determined in public parks of Chile, with a prevalence of between 2–40% of Ancylostoma infecting larvae [17–19].

In rural areas with low economic income in South Africa, China, and Argentina and urban areas of Uruguay, Holland, and the Antilles, the prevalence of Ancylostoma in dogs ranges from 66–96% [3]. The prevalence of Ancylostomiasis in the feces of domestic dogs has been reported to be 54% in Brazil [20], 52.22% in Mexico [21], 13.9–52.9% in Colombia [22,23], 16.9% in Peru [24], and 13% in Argentina [25]. In the Galapagos Islands and Ecuador, the prevalence of *Ancylostoma caninum* is 57.7% in domestic dogs [26], and in Limoncito in the province of Guayas, it was found to be 11.29% [13]. In 2018, Moreno-Cadena et al. found a prevalence between 21.7–47.5% in two locations on the Ecuadorian coast [23], and in Quito, a prevalence of 24.8% was determined in three dog shelters [27].

In domestic dogs studied in an urban sector of Ecuador, a prevalence of 62.5% indicated that the levels were approaching those recorded by Heukelbach et al. [3] in vulnerable areas of developing countries. Over time, if not addressed, these high levels could lead to a public health problem, and the town of Vinces has favorable conditions for the cycle of transmission of this parasitic disease [3]. Therefore, as this case report of CLM and the study of the local prevalence of *Ancylostoma caninum* in Ecuador have shown, this zoonosis was active in dogs, humans, and contaminated soil.

Conclusions

Cutaneous larva migrans (CLM) is a zoonotic disease that can affect the population in endemic areas. It this case, CLM was identified in the sole of the foot of a child. The presence of *Ancylostoma caninum* larvae were identified in the soil and in the feces of dogs, indicating that the community was exposed to a significant environmental risk from this zoonotic disease. Therefore, the population should be educated about sanitary measures and the responsibility of caring for pet dogs and cats, to prevent the transmission of this and other parasites.

Conflict of interest

None.

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