CUTANEOUS LEISHMANIASIS IN CATS (*Felis domesticus*) CAUSED BY *Leishmania (Leishmania) venezuelensis**

Leishmaniasis cutánea en gatos (*Felis domesticus*) causada por *Leishmania (Leishmania) venezuelensis*

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ABSTRACT

In the search for reservoirs and other hosts of American cutaneous leishmaniasis (ACL) in Barquisimeto, Lara State, Venezuela, 4 cats *(Felis domesticus*) were found naturally infected with Leishmania, 3 in the suburb of El Carmen and 1 in San Francisco. The first (male) had a nodular lesion of a brownish red color, about 3.5 x 2.5 cm on the nose and other six nodules on the ears. The other three cats (females) each had a single diffuse lesión about 2 x 3 cm, with the same characteristics, on the nose. After three months metastases were observed all over the skin, this being more apparent on ears, extremities and tails. Smears made from all of the lesions, stained by the Giemsa method, contained abundant amastigotes both inside and outside histiocytes. The parasite isolated in hamsters and in NNN culture medium was identified by isoensyme electrophoresis and monoclonal antibodies as *Leishmania* (*Leishmania*) *venezuelensis*. The implications of these results with respect to both the clinical and epidemiological data are discussed.

Key words: American cutaneous leishmaniasis, cutaneous leishmaniasis in cats, *Leishmania* (*Leishmania*) *venezuelensis*.

RESUMEN

En la búsqueda de reservorios y otros hospedadores de leishmaniasis cutánea americana (LCA) en Barquisimeto, Estado Lara, Venezuela, fueron encontrados 4 gatos (*Felis domesticus*) naturalmente infectados con Leishmania, 3 en el barrio El Carmen y 1 en San Francisco. El primero (macho) tenía una lesión nodular de color rojo parduzco de 3.5 x 2.5 cm, en la naríz y otros seis nódulos en las orejas. Los otros tres gatos (hembras), cada uno tenía una lesión difusa de aproximadamente 2 x 3 cm, con las mismas características, en

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la nariz. Después de tres meses fueron observadas metástasis en toda la piel, éstas fueron más aparentes en las orejas, extremidades y cola. Los frotis de todas las lesiones, teñidos por el método de Giemsa, contenían abundantes amastigotes tanto adentro como afuera de los histiocitos. El parásito aislado en hamsters y en medio de cultivo NNN fue identificado por electroforesis de isoenzimas y anticuerpos monoclonales como *Leishmania* (*Leishmania*) *venezuelensis*. Las implicaciones de estos resultados en relación con los datos clínicos y epidemiológicos, son discutidos.

Palabras claves: Leishmaniasis cutánea americana, leishmaniasis cutánea en gatos, *Leishmania* (*Leishmania*) *venezuelensis*.

INTRODUCTION

Leishmaniasis in cats has rerely been reported in the literature. Mazza [7] found the first case, Mello [8] observed a natural infection of a cat in Brasil, Morsy et al. [10] reported amastigotes in spleen smears from 16 of 78 cats examined in Amman, Jordan, and Craig et al. [4] described a case of dermal leishmaniasis in a Texas cat. However it is apparent that cats infections might be relatively common in some endemics areas for leishmaniasis [2, 11]. While studying an endemic focus of American cutaneous leishmaniasis (ACL) both in humans and domestic animals in Barquisimeto, Venezuela, 4 cats (*Felis domesticus*) were observed with ACL, 3 in the suburb of El Carmen and 1 in San Francisco, near la Ruezga creek. By biological parameters the parasite was considered to be very similar to *Leishmania* (*Leishmania*) *venezuelensis*. The purpose of this work was to describe the clinical characteristics of ACL in cats and identify this causal agent.

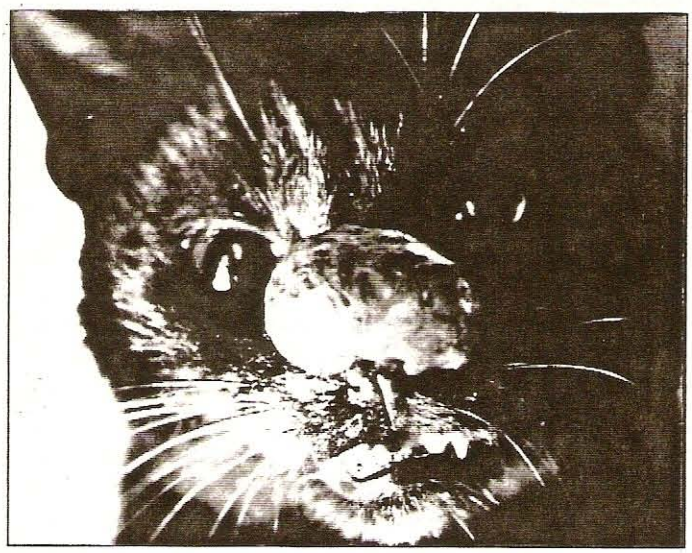

FIGURE 1. LARGE NODULAR LESION ON CAT NOSE CAUSED BY *Leishmania* (*Leishmania*) *venezuelensis*.

MATERIAL AND METHODS

Clinical study

Wandering cats were captured in wire case traps baited with meat, in the suburbs of El Carmen and San Francisco. For each animal a clinical history was made. General data, clinical characteristics of the lesions (location, number, aspect) and most probable place of infection were recorded on a standard observation form. Sucessive visits were made to detect new cases among the felines.

Parasitological study

Each infected cat was given a parasitological examination under anesthesia with 2% RompunR solution (2 - (2,6-Xilodino)-5,6-dehydro-4h-1,3-tiacin-hydrochloride), injected intraperitonealy 0.15 ml/kg of body weight. At the moment of taking the biopsy. Small tissue samples were obtained from the infiltrated edges of the lesions. Three smears were made for each animal and stained by the Giemsa method and observed in the microscope with immersion oil. Isolation of the parasites in hamsters and in culture media was made as previously described [3]. Cats were observed for six months.

Parasite characterization

Isolates were characterized by indirect radioimmune assay, using specific monoclonal antibodies and isoenzyme electrophoresis [3, 5, 9]. For comparison in the characterization of the parasites the World Health Organization (WHO) recomended reference strains were also included.

RESULTS

Three cats were captured in the suburb of El Carmen and one in San Francisco. The first, male, had a cutaneous nodule of a light brownish red color, of about 3.5 x 2.5 cm on the nose and other six smaller nodules on the ears (FIGS. 1 y 2).

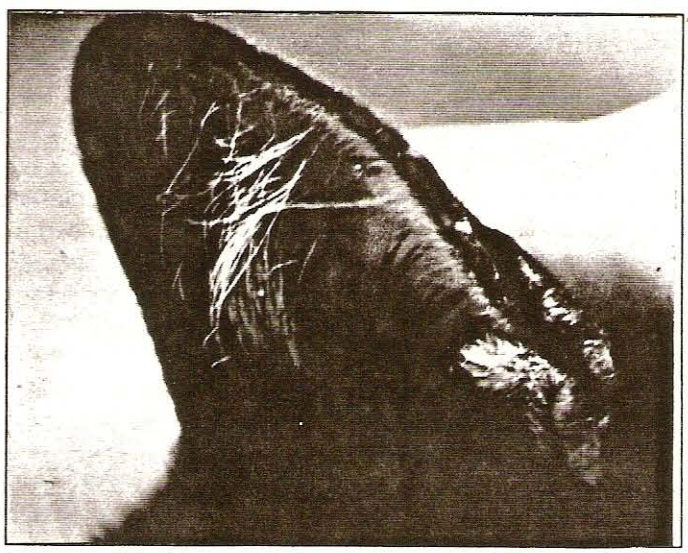

FIGURE 2. METASTASIS TO A CAT EAR CAUSED BY *Leishmania* (*Leishmania*) *venezuelensis*.

FIGURE 3. DIFFUSE NODULE ON A CAT NOSE PRODUCED BY *Leishmania (Leishmania) venezuelensis.*

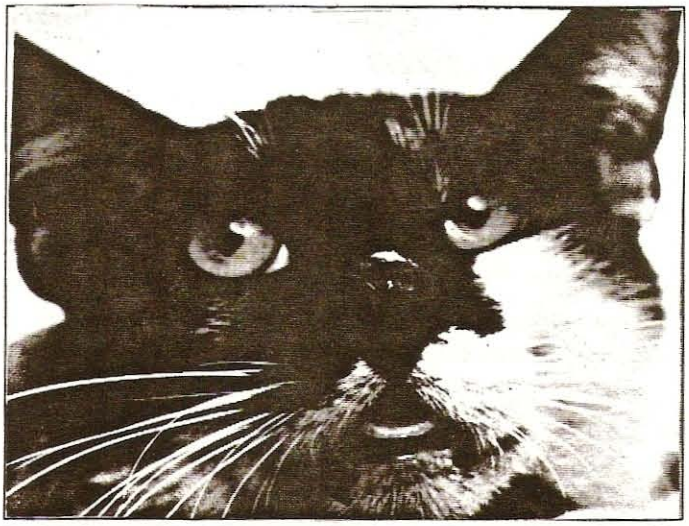

FIGURE 4. DIFFUSE LESION ON A CAT NOSE CAUSED BY *Leishmania (Leishmania) venezuelensis.*

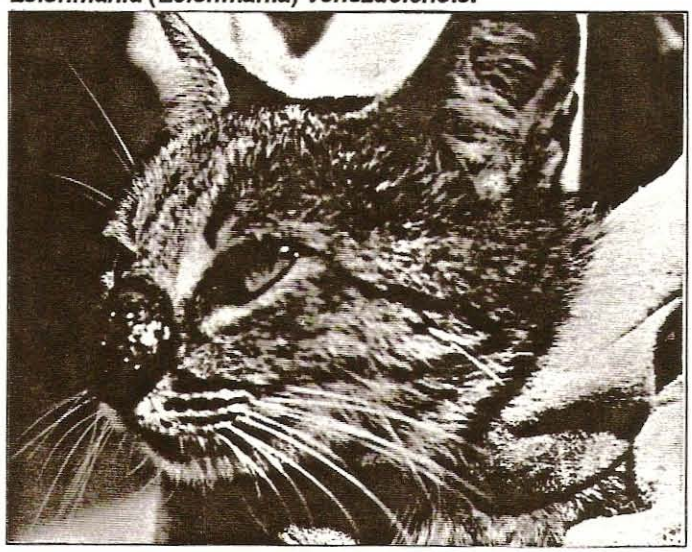

FIGURE 5. EROSIONATED NODULE ON A CAT NOSE DUE TO *Leishmania (Leishmania) venezuelensis.*

The other three cats (females) each had a single diffuse lesion of the same color, about 3 x 2 cm, located on the nose (FIGS. 3, 4 y 5). After three months of observation in the laboratory, metastases were formed all over the skin, these being more apparent on the ears, tail and legs (FIG. 6). Smears made from all of the lesions and stained by the Giemsa method showed heavily parasitized macrophages containing abundant amastigotes both intra and extracellularly and cyst-like forms with hundreds of amastigotes (FIG. 7). Parasites isolated from all cats initially grew well in NNN culture medium, but it was difficult to maintain in the subcultures and in hamsters produced a huge tumorlike inflamation at the point of inoculation with generalized metástasis to the skin with histiocytes filled with amastigotes.

The reactive patterns of all the isolates from cats were very similar to that of *Leishmania* (*Leishmania*) *venezuelensis* reference strain, reacting specifically with the monoclonal antibody V1 [2, 5]. Their Zymodeme contained the WHO reference strain of *Leishmania* (*Leishmania*) *venezuelensis* and this was considered representative of this specie.

DISCUSSION

The clinical characteristics of the nodular lesions in cats were very similar to those produced by *Leishmania* (*Leishmania*) *venezuelensis* in humans [1,3]. The nodular lesions tend to localize themselves without ulcerations, but if untreated generalized metástases can be produced. The location of the lesions on the nose and ears is probably related to the habit of the vectorsa to bite on naked skin, the appropiate temperature of those organs for the development of Leishmania and also to the habit of the cats to wait patiently near the rodent caves where the vector probably lives.

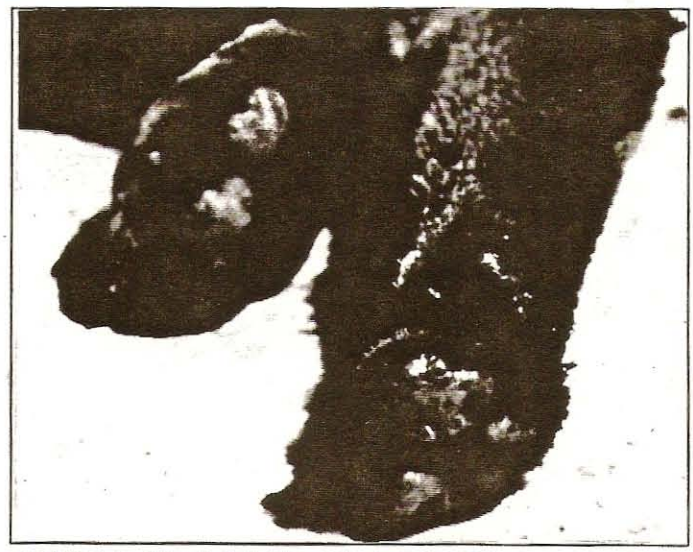

FIGURE 6. METASTASIS ON A CAT LEGS CAUSED BY *Leishmania (Leishmania) venezuelensis.*

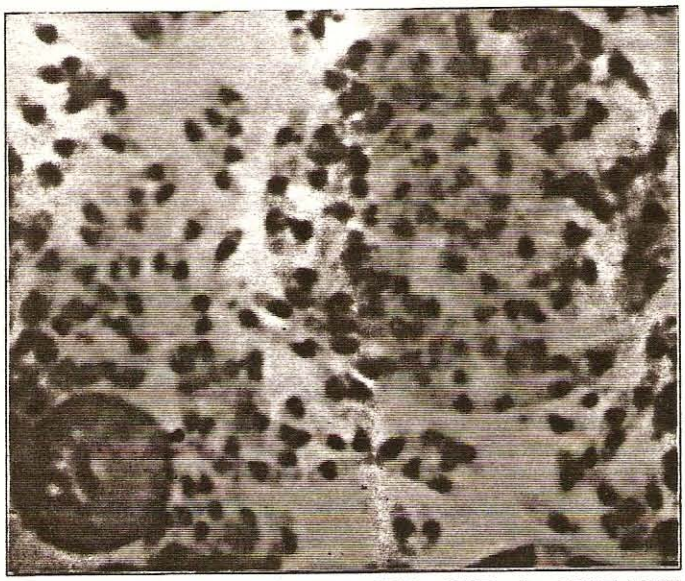

FIGURE 7. FREE AMASTIGOTES AND A CYST-LIKE VACUOLATED MACROPHAGE CONTAINING MANY AMASTIGOTES OF *Leishmania* (*Leishmania*) *venezuelensis.*

This study also showed a clear correlation between human disease and the distribution of the infection in cats. As in human cases of ACL, transmission probably occur within or around the home. In the same house where cats were captured there was a person with an ulceronodular lesion on the shoulder produced by *Leishmania* (*Leishmania*) *venezuelensis*. Although cats migth only be circumstancial victims of *Leishmania* (*Leishmania*) *venezuelensis* infection, a detailed epidemiological study is now in progress to determine their importance as reservoirs for this parasite.

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