URBAN CUTANEOUS LEISHMANIASIS IN BARQUISIMETO, VENEZUELA[1]

Rafael Bonfante-Garrido,[2] Segundo Barroeta,[3] María A. Mejía de Alejos,[3] Enrique Meléndez,[4] Conrado Arredondo,[4] Rafael Urdaneta,[5] and Iván Urdaneta[5]

INTRODUCTION

The epidemiology of cutaneous leishmaniasis in the central portion of Western Venezuela, especially in the states of Lara, Yaracuy, and Portuguesa, has been studied since 1971. Initially, all the foci found were in small scattered settlements near mountainous areas with dense vegetation *(1, 2)*.

However, on 5 May 1974 a case of cutaneous leishmaniasis was observed in a patient 60 years old with multiple nonulcerated nodules, some forming a plaque in the right scapular area and others isolated on both external ears. This infection was acquired in Macuto Forest near the major city of Barquisimeto, capital of Lara State. Its causal agent was identified as *Leishmania mexicana venezuelensis*, whose morphologic and biologic characteristics have already been described *(3)*. Three other indigenous cases were found in 1980 in the districts of La Feria and 23 de Enero (both situated on the banks of the Turbio River) and San Jacinto (not far from La Ruezga Creek) on the edge of the city of Barquisimeto. These cases permitted definitive characterization and taxonomic classification of *L. m. venezuelensis (4, 5)*. On the basis of these findings we drew up a plan for seeking new cases and studying the main clinical and epidemiologic characteristics of cutaneous leishmaniasis in Barquisimeto.

Venezuela's third-largest city, with a population of about 945,000 inhabitants, Barquisimeto (latitude 10°15'N, longitude 60°20'W, altitude 560 m) is located on the Turbio River. The average annual rainfall is 70 cm, and while dense vegetation is found along the Turbio River, the prevailing vegetation elsewhere (including that along La Ruezga Creek, a Turbio River tributary) tends to be xerophytic. Barquisimeto's relative humidity is 65.4%, with a maximum of 100% in the months of June,

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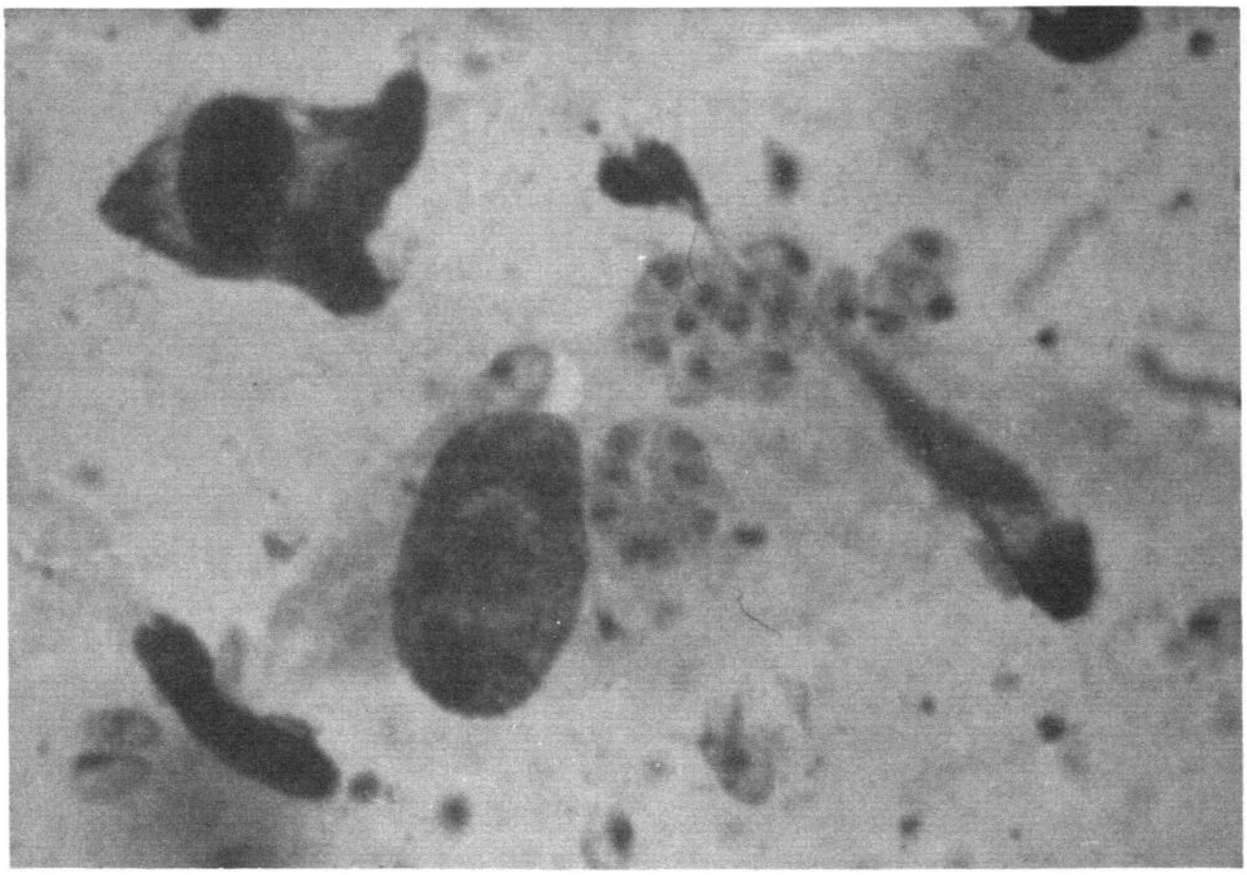
[2] Professor of Parasitology, School of Medicine, Universidad Centroccidental "Lisandro Alvarado," Barquisimeto.

[3] Associate Professor of Dermatology, Hospital Central "Antonio María Pineda," Barquisimeto.

[4] Associate Professor of Parasitology, School of Medicine, Universidad Centroccidental "Lisandro Alvarado," Barquisimeto.

[5] Assistant in Biology, School of Medicine, Universidad Centroccidental "Lisandro Alvarado," Barquisimeto.

Amastigotes of *Leishmania mexicana venezuelensis* stained by the Giemsa method, 1000 X.



July, October, November, and December and a minimum of 22% in April. The average temperature is 25.2°C, with a maximum of 34.1°C in March and a minimum of 15.9°C in December. The local fauna consists of various woodland rodents and marsupials including *Proechimys* sp., *Rattus* sp., *Cuniculis paca, Dasyprocta rubrata, Didelphis marsupialis,* and others.

MATERIALS AND METHODS

A survey was made of Barquisimeto's outlying districts on the banks of the Turbio River and La Ruezga Creek in search of clinical cases of leishmaniasis. Also, educational work was performed that tended to encourage visits to the Dermatology Department of the "Antonio María Pineda" Central Hospital and the Medical Parasitology Section of the "Lisandro Alvarado" Central Western University, facilities that performed the work reported here jointly.

The survey, conducted in 1982, 1983, and 1984 turned up 89 cases, three in 1982, 23 in 1983, and 63 in 1984. Combining these with the four cases detected earlier, a total of 93 cases were studied. Each infected patient was given a parasitologic examination, and 32 patients were also given Montenegro's test. In addition, hamsters were inoculated intradermally with suspensions of tissue taken from each patient's lesions,

and the infecting agent was isolated from the hamsters and grown in culture. Regarding treatment, all of the patients were treated with injections of pentavalent n-methyl glucamine antimonate (50 mg/kg) for 20 consecutive days, and after a week of rest a new series of injections the same as the initial series was administered.

More information on these tests and isolation procedures is contained in the earlier uncondensed Spanish version of this article (see footnote 1).

Results

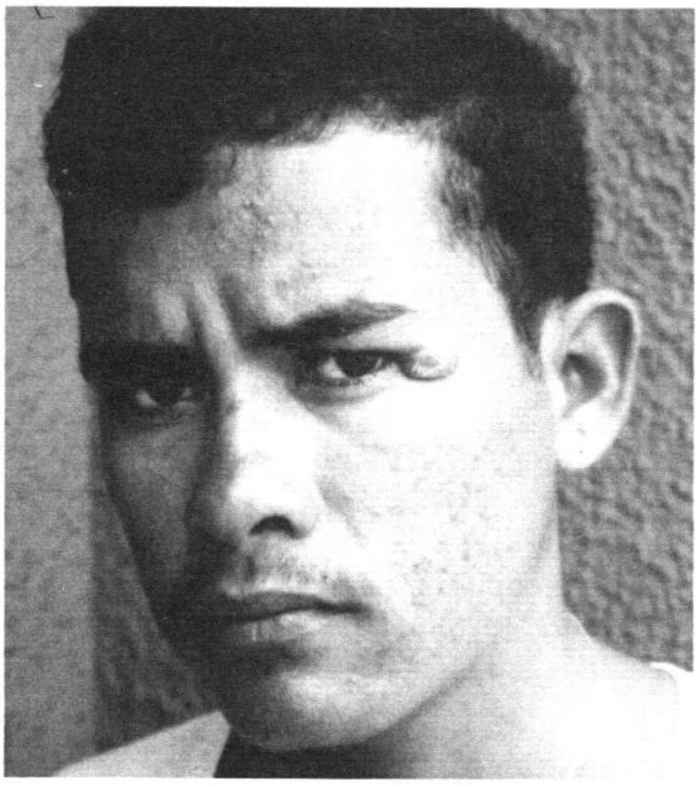
The clinical varieties of cutaneous leishmaniasis encountered, the locations of the lesions, and the age groups of the patients, all subdivided by sex, are shown in Table 1. The face and upper extremities were the areas most commonly affected. In the 12 cases with multiple lesions the face or upper extremities were always involved. The disease afflicted people of all ages and both sexes but was most common in males and in subjects less than 15 years old.

The Barquisimeto districts where the study subjects with cutaneous leishmaniasis resided were along La Ruezga Creek and the Turbio River.

TABLE 1. Data on leishmaniasis in 93 persons from the Barquisimeto area showing the clinical varieties involved, the locations of the lesions, and the ages of the patients, by sex.

	Males		Females		Total	
	No.	%	No.	%	No.	%
I. Clinical varieties of leishmaniasis:						
Classic ulcerous	40	43.0	36	38.7	76	81.7
Nodular	5	5.4	6	6.5	11	11.8
Ulceronodular	3	3.2	3	3.2	6	6.5
Total	48	51.6	45	48.4	93	100.0
II. Location of the lesions:						
Face	20	21.5	17	18.3	37	39.8
Neck	2	2.2	0	0.0	2	2.2
Chest	3	3.2	1	1.1	4	4.3
Upper extremities	13	14.0	13	14.0	26	28.0
Lower extremities	6	6.5	6	6.5	12	12.9
Multiple	4	4.3	8	8.6	12	12.9
Total	48	51.6	45	48.4	93	100.0
III. Ages of patients (in years):						
0–4	10	10.8	10	10.8	20	21.5
5–9	16	17.2	9	9.7	25	26.9
10–14	7	7.5	12	12.9	19	20.4
15–19	6	6.5	3	3.2	9	9.7
≥20	9	9.7	11	11.8	20	21.5
Total	48	51.6	45	48.4	93	100.0

Lesions caused by *Leishmania mexicana venezuelensis* infecting Barquisimeto area residents: (A) nodular lesion; (B) nodular lesion (the cut is the site of a biopsy); (C) nodular lesion on shoulder; (D) ulceronodular lesion.



A

B

C

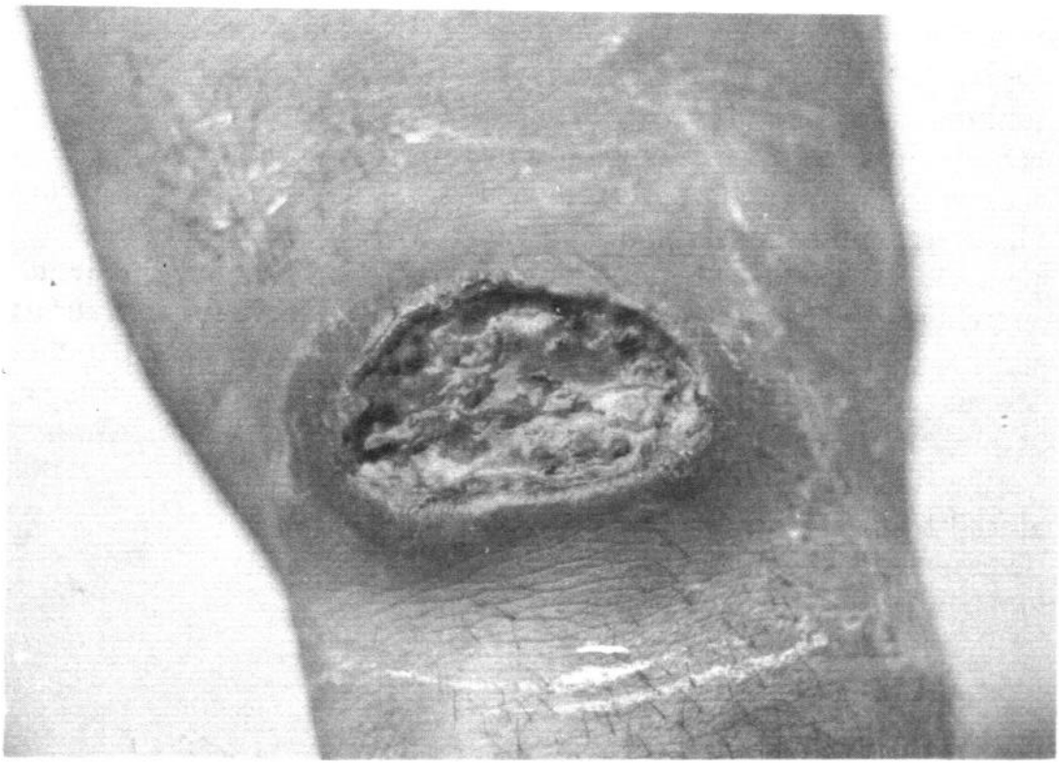
D

Those districts along the creek were San Francisco (18 patients), El Carmen (8 patients), San Jacinto (6 patients), San Benito (6 patients), El Trompillo (5 patients), Las Veritas (4 patients), Barrio Unión (4 patients), Santa Isabel (2 patients), El Olivo (2 patients), Altos de Jalisco (2 patients), Los Luises (2 patients), Eligo Macías Mujica (1 patient), La Pastora (1 patient), El Jebe (1 patient), Las Delicias (1 patient), Rafael Caldera (1 patient), La Manga (1 patient), La Apostoleña (1 patient), and San Lorenzo (1 patient). Those along the Turbio River were Macuto (4 patients), La Mata (3 patients), El Manzano (2 patients), Bellavista (2 patients), San Vicente (5 patients), La Feria (1 patient), 23 de Enero (1 patient), Cuesta Lima (1 patient), Los Pinos (1 patient), San Juan (1 patient), La Carucieña (1 patient), Santo Domingo (1 patient), and La Lagunita (1 patient).

The Montenegro test reactions were between 5 and 9 mm in diameter in 23 cases (71.9%) and between 10 and 13 mm in diameter in nine cases (28.1%).

The strains isolated from 88 of the patients all produced a tumorlike inflammation at the point of inoculation in hamsters. These lesions, which grew rapidly, were found to contain histiocytes filled with amastigotes. After a few months metastases were observed all over the skin, these being most apparent on the extremities, nose, ears, and tail. These leishmanias initially grew well in NNN (Difco) medium, but it proved extremely difficult to maintain them in subcultures. The strains isolated are morphologically and biologically very similar to *L. m. venezuelensis (3).*

Ulcerated lesion caused by *Leishmania braziliensis* ssp.



The strains isolated from five of the patients were morphologically and biologically very similar to *Leishmania braziliensis* ssp.

More information on the characterization of both of these leishmanias is contained in reference 6.

Regarding possible vectors, the following sandflies have been found in Macuto Forest: *Lutzomyia olmeca bicolor, L. panamensis,* and *L. lichy* (Arredondo and Bonfante-Garrido, unpublished observations), and also *L. ovallesi, L. migonei, L. gomezi,* and *L. evansi (7).*

All of the 93 study subjects recovered following treatment, and as of early 1987 no relapses had been reported.

Discussion

The clinical characteristics of the ulcerous lesions produced by *L. m. venezuelensis* were very similar to those produced by *L. braziliensis,* only somewhat smaller. The nodular lesions tended to localize themselves without ulceration. No lesions of the nasal mucosa or cases of diffuse anergic cutaneous leishmaniasis were observed. (The latter is found more frequently among individuals with immunologic defects and is characteristically resistant to the therapeutic action of the pentavalent antimonials—*8.*)

The frequent location of the lesions on the face and upper extremities is probably related to the habits of the vector. In cases of Chiclero's ulcer produced by *L. m. mexicana,* the vector is *Lutzomyia olmeca olmeca (9)* and 60 to 90% of the lesions are found on the ears *(10).* These data support the hypothesis that *L. o. bicolor* is the most likely vector of *L. m. venezuelensis.*

The 20 cases found among children under five years old suggest that transmission occurred within or around the home. We believe that the proximity of the infected individuals' homes to La Ruezga Creek and the Turbio River facilitated access to those homes by the vector.

The patients with ulcerous lesions and the strongest responses to Montenegro's test recovered most easily; two experienced a spontaneous cure. In contrast, the individuals with nodular lesions recovered more slowly.

Summary

Since 1974 significant numbers of cutaneous leishmaniasis cases have turned up in the area of Barquisimeto, Venezuela's third-largest city and the capital of Lara State. One case was found in 1974, three more in 1980, and 89 more during the course of surveys conducted in 1982–1984.

All 93 of these patients received parasitologic examinations and 32 were given the Montenegro test. In addition, suspensions of tissues from their lesions were inoculated into hamsters, and the infecting agents were isolated by culturing sera obtained from the hamsters' resulting lesions.

The Montenegro test produced responses with diameters from 5 to 9 mm in 23 patients and from 10 to 13 mm in nine. Parasite strains isolated from 88 of the patients were morphologically and biologically similar to *Leishmania mexicana venezuelensis,* and

parasite strains isolated from five patients were morphologically and biologically similar to *L. braziliensis* ssp. The authors suggest that *Lutzomyia olmeca bicolor* is the most likely vector of *L. m. venezuelensis*. All of the patients studied were given a course of treatment with antimonial medication and all recovered.

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