TRADITIONAL TREATMENTS USED IN AN ENDEMIC AREA OF CUTANEOUS LEISHMANIASIS IN PERU

Roberto Pineda-Reyes[1,a], Alejandro Llanos-Cuentas[2,b], Mauricio Dancuart[1,c]

ABSTRACT

In order to know the first-choice treatment by villagers of an endemic area of Cutaneous Leishmaniasis (CL) prior to medical attention in a health care center, a cross sectional study was realized in Pichupampa town. A census was made in order to collect demographic data and previous history of CL. 254 participants were surveyed. 41.7% (106/254) of the village had CL at least once in their lives and only half of them went to a health center to seek for primary care. 76/106 (71.7%) used some traditional treatment as their first choice and only 23.6% (25/106) subjects went to a health-care center without manipulation of their lesions. It's evident that a high percentage (71.7%) of people potentially infected by CL manipulate and treat their lesions with traditional treatments prior to professional health-care, actions that could interfere with the diagnosis and effectiveness of the program implemented by the Health Ministry.

Key words: Leishmaniasis, cutaneous; Treatment; Medicine, traditional (source: MeSH NLM).

INTRODUCTION

Cutaneous leishmaniasis (CL) is a disease caused by a parasite from the genus *Leishmania*. CL is considered one of the world's most neglected diseases and affects people in rural areas, mostly living in poverty and extreme poverty [1,2]. According to the World Health Organization (WHO; 2010), CL prevalence is increasing; 350 million people worldwide are at risk of leishmaniasis and approximately 2 million new cases are reported per year [2].

In Peru, leishmaniasis is the second most frequent tropical endemic disease and the third most important cause of morbidity among infectious diseases after malaria and tuberculosis [1]. Approximately 74% of the area of Peru is considered endemic, encompassing the inter-Andean valleys and the mountains as well as the high and low jungle [1,3]. Accordingly, exposed populations have developed a set of traditional treatments, i.e., application of physical and/or chemical modalities on the basis of beliefs and experience passed down from generation to generation.

The management of lesions with traditional treatments before evaluation by healthcare personnel constitutes a major public health problem because there is an increase of inflammation in the wound area as well as necrosis, and the typical features of the lesions are altered, thus there is a risk of decreased sensitivity of parasitological diagnostic tools [3,7]. These factors affect effectiveness of the diagnosis and control programs.

The objective of this study was to determine the frequency and the type of treatment used by residents of CL-endemic areas as a first-line therapy prior to care in conventional healthcare institutions.

THE STUDY

A population-based cross-sectional study was conducted in August 2012 in the town of Pichupampa, located 2250

[1] Faculty of Medicine, *Universidad Peruana Cayetano Heredia*. Lima, Peru.
[2] *Instituto de Medicina Tropical Alexander von Humboldt*, *Universidad Peruana Cayetano Heredia*. Lima, Peru.
[a] Physician; [b] physician specialized in tropical and infectious diseases, doctorate in medicine; [c] medical student
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meters above the sea level, in the Leoncio Prado district, Huara province, Lima region. Lima is among the regions that reported more cases of CL, with the Leoncio Prado district being the one with the most cases reported along with the Ambar district (27.5% and 29%, respectively) [8,9]. Leoncio Prado contains eight major towns: Santa Cruz, Huamboy, Huanangui, Paran, Pichupampa, Santo Domingo de Apache, Tantan y Huampan. Pichupampa, Santo Domingo de Apache, and Paran are the largest, with populations of ~300 inhabitants.

With prior authorization by a representative of the community and its steering committee, a community map was created, indicating the location of the homes. At each home, permission to conduct the census was requested; 100% of the heads of family agreed; all of these homes were visited. A history of CL in any family member was recorded during the census, in addition to demographic variables. If there was a history of CL, the head of the family was invited to participate, and the rationale and aims of the study were explained. Informed consent was explained to those who chose to participate, and they were given a document to read and sign.

Subsequently, the person who made the decisions on family health problems was the one who filled out the questionnaire. Nevertheless, usually other family members were present during the interview and also gave their opinions on the questions. When selecting the person to answer the survey, the following criterion was used: 18 years of age or older. The exclusion criteria were temporary residence (less than 6 months) within the community or an intellectual disability that could prevent adequate answers to the questionnaire.

Persons in the family with a history of CL were also examined, and the diagnosis was verified by identifying the typical scar or an active lesion.

The definition of "traditional medicine" was borrowed from the General Guidelines for the Evaluation and Research Methodologies of Traditional Medicine, the same definition used by the WHO: "The full body of knowledge, skills and practices based on theories, beliefs and indigenous experiences of different cultures, whether explainable or not, used for maintenance of health, as well as for prevention, diagnosis, improvement or treatment of physical or mental illness" [10].

The statistical analysis was performed in the STATA/SE 12.0 software for Windows. Descriptive statistics were used; absolute and relative frequencies for the categorical variables were determined, such as gender (male/female) and CL (present/absent). An arithmetic measure was used for quantitative variables such as age. The chi squared test was used to identify a possible association between categorical variables: male or female gender and the presence or absence of CL. Correlations with $p < 0.05$ were deemed statistically significant.

The study protocol was approved by the Institutional Ethics Committee of the Cayetano Heredia National Hospital.

FINDINGS

The general characteristics of the population are presented in Table 1. The age was 25.89 ± 18.88 years (mean ± SD); 55.1% of the participants were males; 1.9% were illiterate, 21.3% completed high school, and 2.8% had higher education; 33.9% of the participants worked in agriculture, and the same percentage was recorded for students; 20.5% performed household chores.

All the inhabitants of the community who were present at the time of our visit were selected, which added up to 254 participants including adults and children. Sixty-one homes (79.2%; total number 77) in the community were surveyed. Other homes were not surveyed because the families were absent due to work, travel, or other external factors; 81.8% of the surveyed families had at least one person with a history of CL.

Of the 254 participants, 106 (41.7%) reported having had CL at some point in their life. In this group, 71 of 106 (66.9%) reported having received treatment with pentavalent antimony previously; 36 of 106 (33.9%) reported that they had never received any conventional medical treatment. In addition, we found that 51 of 106 (48.1%) reported that they had never visited a healthcare institution, and 77 of 106 (72.6%) reported receiving traditional treatments previously.

As the first choice after appearance of a lesion suspected of CL, 76 of 106 (71.7%) used traditional treatments, 25 of 106 (23.6%) went to a healthcare institution, and in 4 of 106 (3.7%) reported self-treatment with antimonial agents (Figure 1). Thirty-one of 106 (29.2%) went to a healthcare institution as a second choice after the appearance of a lesion suspected of CL.

Of the 76 people who used traditional treatments as a first-line therapy, only 20 (26.3%) reported being cured by these methods, 3 of 76 (3.9%) got worse,

Table 1. Characteristics of the participants

Characteristics	N = 254 (%)
Age (years)	25.89 ± 18.88
<5	29 (11.4)
5–17	70 (27.6)
18–59	140 (55.1)
>60	15 (5.9)
Gender	
Female	114 (44.9)
Male	140 (55.1)
Education	
Illiterate	5 (1.9)
Incomplete elementary school	55 (21.6)
Completed elementary school	57 (22.4)
Incomplete high school	42 (16.5)
Completed high school	54 (21.3)
Higher education	7 (2.8)
Occupation	
Student	86 (33.9)
Farmer	86 (33.9)
Merchant	4 (1.6)
Housekeeper	52 (20.5)
Other	6 (2.4)

and 40 of 76 (52.6%) were not cured and had to find a second treatment option, which was self-treatment with antimonial agents for 12 people and visiting a healthcare institution for 28 people. Only one person had an active lesion at the time of this study (with diagnosis and treatment by a healthcare institution). In 11 of 76 cases, the participants could not recall whether the lesion healed after traditional treatments or healed spontaneously; in 1 case, the lesion was not cured by traditional treatments but then healed without the need for medical treatment.

Regarding the types of traditional treatments, 47 (44.3%) participants mentioned the use of herbs, leaves, and plants that grow in the area. The second most popular category was the application of acids, such as citric acid and battery acid, among others (38 persons: 35.8%), followed by application of chemicals such as alcohol and menthol (16 persons: 15.1%), and lastly, the local application of self-prescribed antibiotics (5 persons: 4.7%). Moreover, we found that the most popular traditional treatments are the application of "lemon and salt" and "fireplant" herb (*Euphorbia heterophylla*), followed by the use of disinfectants such as alcohol and burning the wound with battery acid (Table 2).

DISCUSSION

The Pichupampa population showed high prevalence of CL (41.7%); in 81.8% of the families surveyed at least one member had a history of CL. It is noteworthy that this figure could be a low estimate because of migration:

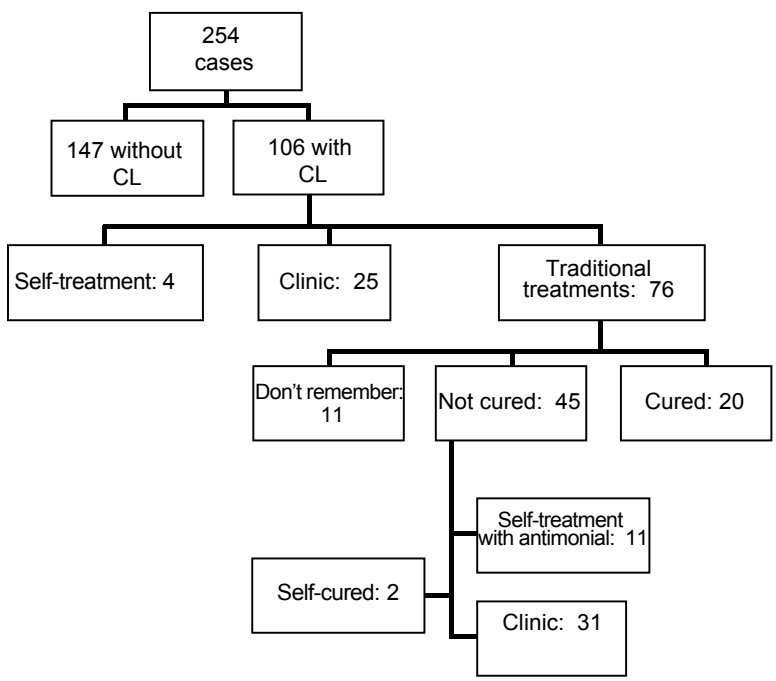

Figure 1. The flowchart of cases of cutaneous leishmaniasis (CL) in the village of Pichupampa

Table 2. Traditional treatments used by the residents of Pichupampa

Traditional treatment	Scientific name	N=106	(%)
Salt with lemon		25	(23.6)
Fireplant treatment	*Euphorbia heterophylla*	21	(19.8)
Battery acid		8	(7.5)
"Oropimente"	*Sedum telephium*	7	(6.6)
Alcohol	Etanol	7	(6.6)
Plantain	*Plantago major*	5	(4.7)
Lemon	*Citrus limon*	5	(4.7)
Tara	*Caesalpinia spinosa*	4	(3.8)
Menthol	5-metil-2-isopropil ciclohexa-1-ol	4	(3.8)
Pink evening primrose	*Oenothera rosea*	3	(2.8)
Garlic	*Allium sativum*	3	(2,8)
Nettle	*Urtica dioica L.*	2	(1.9)
Vick® Vaporud		2	(1.9)
Ampicillin		2	(1.9)
San Carlos weed		1	(0.9)
Other herbs		1	(0.9)
Sulfanil®		1	(0.9)
Terramycin		1	(0.9)
Gypsum		1	(0.9)
Powdered penicillin		1	(0.9)
Timolin		1	(0.9)
Salt	Sodium chloride	1	(0.9)

some families now living in this town come from places where CL is not endemic, whereas young members of families living in Pichupampa for more than three generations have migrated to nearby cities such as Huacho.

In this community, according to its oldest inhabitants, "this disease has always been present"; therefore, there are popular folk methods for the diagnosis and treatment of this disease dating back more than 50 years. The area's residents usually can easily recognize a typical CL lesion, but their problem is the treatment.

As many as 71.7% of the participants with a history of CL self-medicate using traditional treatments of various types as a first-line therapy, which, in practice, is the application of caustic substances that burn the lesion. In contrast, only 23.6% choose to visit a healthcare institution as a first-line therapy; we noticed that this group was composed of younger families. This result was suggestive of a change in attitudes in the community; however, most people still prefer to use a traditional treatment before conventional medical treatment.

The cumulative prevalence of CL that we detected is lower in comparison with the results of other studies in endemic areas during the 1987–1988 period [3,11], which showed that approximately 70–80% of the inhabitants had the typical scars resulting from the disease. On the other hand, our findings are in agreement with studies in other endemic areas of South American countries such as Ecuador in 1994 and 2001: 47% [6] and 49.7% [12], respectively, and in Colombia in 1991: 29.9% [7]. This lower prevalence may be due to multiple factors such as improvements in the disease control program, better education and knowledge among the inhabitants, and migration to the city.

It is important to mention that although Pichupampa is an endemic area for CL, the results of this study are based on a crosssectional survey and examination of the typical scar resulting from the disease, without confirmation by laboratory tests. This is a limitation of our study because other dermatological diseases such as sporotrichosis can cause lesions with similar characteristics. On the other hand, as demonstrated in studies by Llanos-Cuentas and Davies [11], in endemic areas, the classic lesion of CL correlates well with positive results of the Montenegro test.

No differences in prevalence were found between the genders. Although there were more males in the community, the number of cases of CL among males did not surpass those in the female group significantly ($p = 0.687$). This characteristic is typical of Andean CL whose transmission is peridomiciliary, unlike jungle leishmaniasis which is epidemiologically more prevalent in males and shows occupational transmission.

Moreover, most of the time, the man is the head of the family, but the person who makes the decision on how to handle the disease tends to be a woman (housewife). These findings make it clear to whom the educational intervention must be addressed. Furthermore, almost a half (48.1%) of the people with a history of CL reported never having visited a healthcare institution, but 71 of 106 (66.9%) received treatment with an antimonial agent at some point, i.e., either the surveyed people obtain these ampoules without a prescription or there are third

parties who administer these drugs without supervision of a healthcare professional (Figure 1).

In terms of the type of treatment used, the results are consistent with the studies in Ecuador and Colombia mentioned above, where the most common modality is topical application of plant material such as herbs, leaves, or flowers, followed by the burn therapy with chemicals, acids, and application of hot substances. We found that the most popular custom is application of a lemon and salt; one-third of the persons who received traditional treatment were treated by this method. The second most common custom was local application of the herb "fireplant" (*E. heterophylla*) to the lesion (19.8% of cases). This plant grows in the vicinity of the community, in the forest, and the notion about its healing benefits has been transmitted from generation to generation, among the oldest families of Pichupampa and in some other neighboring communities such as Santo Domingo de Apache. Nevertheless, fireplant's leishmanicidal activity has been found to be weak to moderate [13].

Another finding is that the lesion was not cured, and even worsened, in more than a half of the cases when traditional treatments were used as a first choice (cure rate of traditional treatments: 26.3%). These treatments change characteristics of the primary lesion and therefore may alter the parasite load of the wound, affect parasitological diagnosis, and increase healing duration.

In conclusion, it is clear that a high percentage of the study population when infected with CL (or suspected CL), treat their lesions with traditional therapies before visiting a healthcare institution. This situation may decrease the rate of positive results of swabbing and *in vitro* culture diagnosis in patients with treated lesions; however, the effects of traditional treatments on the effectiveness of CL diagnosis is still unknown.

Author contributions: the conception and design of the study were carried out by ALLC. REPR and JMDM participated in the collection and analysis of data. REPR and ALLC performed the data analysis and interpretation, writing of the manuscript, and approval of the final version.

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Correspondence: *Roberto Enzo Pineda Reyes*
Address: Calle Bayóvar Sur 121 Urbanización Prolongación Benavides Santiago de Surco
Phone number: 995112164
E-mail: roberto.pineda.r@upch.pe