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Approach to knowledge, attitudes, and practice of in leishmaniasis a focus of the Colombian Caribbean

Aproximación a los conocimientos, actitudes y prácticas sobre leishmaniasis en un foco del Caribe colombiano

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ABSTRACT

Introduction: Leishmaniasis is a zoonosis with a great impact in Colombia due to the high number of cases occurring annually, which makes it a public health problem. **Objective:** To explore health knowledge, attitudes, and practices related to leishmaniasis in the municipality of Ovejas, located in the Colombian Caribbean, where the disease is endemic. **Method:** Epidemiological surveys were carried out on 63 people to assess their knowledge about leishmaniasis, its vector, insect control practices, and community perceptions. **Results:** 81% of those surveyed knew about cutaneous leishmaniasis and 76,2% about visceral leishmaniasis. Only 20,6% exhibited knowledge about the vector, and approximately 54% of individuals adopted measures to prevent insect bites, with fumigation being the primary method. Notably, 85,7% of participants attributed the responsibility for leishmaniasis control to health authorities, whereas 46% considered it a community concern. **Conclusions:** It is concluded that although the community is aware of leishmaniasis, they do not know the vector and do not implement measures to control it, due in part to the lack of knowledge, and the perception they have about the disease control responsibility.

Keywords: Leishmaniasis ; Knowledge; Health attitudes and practices; Colombia.

RESUMEN

Introducción: la leishmaniasis es una zoonosis de gran impacto en Colombia por el elevado número de casos que se presentan cada año, lo que la convierte en un problema de Salud Pública. **Objetivo**: explorar los conocimientos, actitudes y prácticas en salud sobre la leishmaniasis en el municipio de Ovejas, en el Caribe colombiano, donde la enfermedad es endémica. **Método:** se realizaron encuestas epidemiológicas a 63 personas para explorar los conocimientos sobre leishmaniasis, su vector, prácticas

Palabras clave: leishmaniasis; conocimientos; actitudes y prácticas en salud; Colombia.

de control del insecto y percepción de la comunidad. **Resultados:** el 81% de los encuestados conocían la leishmaniasis cutánea y 76,2% la leishmaniasis visceral. El 20,6% reconocía el vector y el 54% de las personas practicaban medidas para evitar la picadura de insectos, principalmente la fumigación. El 85,7% de los encuestados afirmaron que las autoridades de salud son responsables del control de la enfermedad,

INTRODUCTION

Leishmaniasis is a neglected zoonotic disease caused by parasitic protozoa of the genus *Leishmania*. In America, it is transmitted by insects of the genus *Lutzomyia*. It is estimated that up to one million new cases occur each year, and between 20,000 and 30,000 deaths occur worldwide[1,2].

In Colombia, leishmaniasis is a priority public health event due to its distribution in much of the country and its high number of cases; in the last decade, an annual average of nearly 8,000 cases has been registered, according to the Surveillance System Public Health (SIVIGILA). Furthermore, the three primary clinical forms of the disease occur in the country: cutaneous leishmaniasis (CL), mucosal or mucocutaneous leishmaniasis (CML), and visceral leishmaniasis (VL)[3].

In the Colombian Caribbean, the municipality of Ovejas is the most crucial focus of leishmaniasis in the department of Sucre. According to SIVIGILA, this municipality has historically contributed 51% of the leishmaniasis cases in Sucre and close to 11% of the VL cases in the country4. In recent years, the appearance of cases of indigenous leishmaniasis in the urban area of Ovejas has become a public health concern, as this situation has been accompanied by the domiciliation of vectors, the discovery of infected domestic and wild animals, and environmental changes[5-9].

The recent urbanization of leishmaniasis in Ovejas and the increase in cases during the COVID-19 health emergency (31 cases in 2020, 67 in 2021, and 120 in 2022) demonstrate a change in disease transmission dynamics. Likely, factors such as community ignorance and inadequate implementation of control measures are associated with this phenomenon, given that in Colombia, few studies have addressed knowledge, attitudes, and practices (KAP) about leishmaniasis in the populations where this disease is endemic[10-15].

A KAP study on CL in 2014 in the rural area of Acandí (Chocó), where 252 people participated, found that although the condition is widely known among people. They relate it to the bite of an insect, mainly in the jungle or forest; it is common for residents not to adopt preventive measures because they consider getting sick inevitable[10].

A similar scenario was reported in 2006 in a rural area of three municipalities of Huila in the Andean region. Although among the 249 interviewed, the levels of knowledge of the LC (86%) and the vector (98%) were high, only 35% of those who knew about the disease implemented measures to control it[11].

For its part, in the Caribbean region, the only CAP study on leishmaniasis carried out to date shows that just over 50% of the 409 respondents from Tierra Alta and Valencia in the department of Córdoba know about LC and that only 15% of the total consider it as a vector-transmitted disease[13,] which reflects a low knowledge of CL and its mode of transmission.

In this sense, previous research shows that despite the high level of knowledge of leishmaniasis, in some regions, there are limitations in the practice of control measures, which may be related to how people living in these places perceive the illness. Considering the above, given that in Ovejas, the knowledge and perceptions that the community has about leishmaniasis are unknown, in recent years, the number of cases has increased drastically, and a process of urbanization of the disease is currently evident.

The objective of the present study was to investigate the KAP on leishmaniasis in the urban area of the municipality of Ovejas, department of Sucre, Colombia.

METHOD

Type of study

A quantitative and descriptive study was implemented.

Study area and population

The study was conducted in five neighborhoods in the municipality of Ovejas, Sucre: La Pradera, Santa Teresa, Villa Paz, La Ciudadela, and Don Miguel. These neighborhoods were selected for their recent human and canine leishmaniasis case history.

Ovejas has a population of 22,384, with a similar proportion of men and women, of whom about half reside in the municipal seat. Additionally, agriculture and livestock are the municipality's main economic activities[16,17].

Participants

The sample was selected through non-probabilistic sampling, determined by convenience, and consisted of 63 people of legal age who had permanent residence in the study area.

Instruments

The demographic and veterinary sheet from the manual of procedures for surveillance and control of leishmaniasis in the Americas of the Pan American Health Organization[18] was adapted to prepare the epidemiological survey and the questions of the KAP questionnaire. See Table 1. The instrument was validated in a pilot test in which three experts participated, two with doctorates and one with master's degrees, and this was applied in two towns in the municipality of Ovejas, where outbreaks of CL occurred in 2022.

Procedure and collection of information

Epidemiological surveys were applied through house-to-house visits between December 2022 and April 2023. The questionnaire comprised 12 closed questions, focused on four main topics: knowledge of the disease, the vector, control methods, and perception of the disease control responsibility. In addition, basic information was collected from the respondents (age, occupation, and level of education), as well as characteristics of the homes (construction materials, presence of animals, and access to public services) and history of the disease in the family or the community.

The research incorporated the analytical categories of the social determination of health proposed by Breilh[20]. These categories allow understanding health and illness as a dialectical process, where individual and collective health are linked in a complementary way. Different domains and dimensions of analysis were addressed, including singular, particular, and general elements. These elements refer to how people interact in their daily lives in a social context that influences the lifestyles of different population groups. These lifestyles, in turn, impact people's health.

Statistical analysis

The information obtained was systematized and classified using Microsoft Excel. The descriptive analysis included calculating percentages performed in the Epi Info™ software version 7.2.5[19].

Declaration of ethical aspects

This study considered compliance with the principles and ethical standards of the 1975 Declaration of Helsinki[20] and its subsequent revisions and Resolution 8430 of 1993 of the Colombian Ministry of Health for research with human participation[21]. Information and data management were done while maintaining the anonymity of the participants, from whom informed consent was obtained.

This study was carried out within the framework of the project “Implementation of a geographic information system to strengthen the epidemiological surveillance of leishmaniasis in the Colombian Caribbean region: Sucre” with code BPIN 2020000100024, whose procedures were endorsed by the Committee of Bioethics of the University of Sucre in ordinary session No. 07 of 2019.

Table 1. KAP survey questionnaire.

1. Do you know a disease in which a rounded pimple appears that can turn into a sore, sometimes hurts, and takes up to six months to heal?
   a) Yes
   b) No
2. Do you know a disease that causes general discomfort, abdominal pain and increase in size, weight loss, sweating at night, and that mainly affects children under five years of age?
   a) Yes
   b) No
3. What is the disease called?
   a) whistle sting
   b) Leishmaniasis
   c) Do not know, not answer
   d) Other. Which? _____
4. Do you know an insect that has the following characteristics? (Read each one first, and if you recognize at least three, the answer is YES)
   a) Itches during the night
   b) It is smaller than a mosquito
   c) It has standing wings
   d) It moves with jumps and flies short
   e) The bite burns on the skin
   f) When it itches, it leaves a red spot on the skin.
5. What is the name of the insect?
   a) Hello or allude
   b) Burner
   c) Palomilla
   d) Gnat
   e) Plague
   f) Do not know, not answer
   g) Other. Which? _____
6. What disease does this insect transmit?
   a) Pimple symptoms (hive, itch)
   b) Leishmaniasis
   c) None
   d) Do not know, not answer
   e) Other. Which? _____
7. What measures do you use to avoid being bitten by these insects?
   a) None
   b) Poison fumigation
   c) Sahumerio
   d) Awnings
   e) Other. Which? _____
8. How can leishmaniasis be prevented?
   a) Using awnings
   b) With repellent
   c) Eliminating mosquitoes
   d) It cannot be prevented
   e) Do not know, not answer
9. Who do you think should be in charge or is responsible for controlling leishmaniasis?
   a) Local and departmental health sector
   b) Local and departmental political sector
   c) Community
   d) All of the above
   e) None of the above
   f) Other. Which? _____
10. Do you know of any family member or acquaintance in the community who has recently had leishmaniasis?
    a) Yes
    b) No
11. Do you have a family member or acquaintance in the community who has had leishmaniasis?
    a) Yes
    b) No
12. Are people in your home currently suffering from skin lesions compatible with leishmaniasis?
    a) Yeah
    b) No

RESULTS

Population characterization

A total of 63 epidemiological surveys were carried out. Among those surveyed, women dominated, with 73%. The most common age group was 26 to 59 (74.6%), followed by young adults between 18 and 25 (15.9%) and older adults (9.5%). Table 2 provides more details.

The most common occupation among respondents was housewife (69.8%), followed by agriculture (11.1%) and commerce (3.2%). The percentage of unemployed was 7.9%, while the remainder was

distributed among people dedicated to barbering, motorcycle taxis, civil engineering, various trades, and in the process of academic training (8%).

Fifty-seven percent of those surveyed had secondary education, 23.8% had completed primary education, 12.7% did not, 4.8% received training as technicians or technologists, and only 1.6% had achieved higher education (Table 2).

Table 2. Sociodemographic data of the respondents.

Variable	Category	n	%
Sex	Female	46	73
	Male	17	27
Age range	18-25 years	10	15.9
	26-59 years	47	74.6
	60 years or older	6	9.5
Scholarship	Primary	15	23.8
	Secondary	36	57.1
	Technician or technologist	3	4.8
	Academic	1	1.6
	None	8	12.7

Housing characteristics

Seventy-six percent of the homes had block walls, 19% of bahareque, 3.2% of wood, and 1.6% of other materials. The roofs were mainly made of *Eternit* (61.9%), zinc (36.5%), and only 1.6% of palm. 76.2% of the floors in the homes were made of cement or tile, and 23.8% were made of dirt.
Regarding annexes to the home, 79.4% did not have any, 12.7% had a chicken coop, 3.2% a pig house, and 4.8% simultaneously had a chicken coop and a pig house.

Regarding access to public services, 100% of the homes had electricity, 98.4% had an aqueduct, 63.5% had a natural gas connection, 88.9% had sewage, and only 41.3% had a cleaning service. Meanwhile, 20.6% of those surveyed threw garbage outdoors.

Knowledge of leishmaniasis

Of the respondents, 74.6% identified leishmaniasis's cutaneous and visceral form. 17.5% did not know the clinical presentations, and 7.9% knew one of the two forms. 81% of people knew about LC, while 76.2% knew about LV—more information in Table 3. Considering the respondents' sex, women were the most knowledgeable about the disease. Likewise, of the total number of people aware of both clinical forms, 66% knew it only by the name leishmaniasis, 6.4% as whistle bite, 23.4% by the two previous names, 2.1% as weakness, and the remaining 2.1% did not know what to call it despite recognizing its clinical signs.

Table 3. Percentage of respondents with knowledge about leishmaniasis.

Sex	LC (%)	LV (%)	LC and LV (%)
Women	74.5	75.0	74.5
Men	25.5	25.0	25.5
Total	81.0	76.2	74.6

Vector knowledge

Twenty percent of those surveyed considered themselves knowledgeable about the insect that transmits leishmaniasis (they identified at least three distinctive characteristics). Of these, only 53.8% related the insect to the transmission of this disease.

Of the respondents, 77.8% claimed to know an insect called "alú or alludo" that transmits a disease (without mentioning which one). In comparison, 12.7% recognized this same insect under the name "gnat." and in lower percentages as "pest" (3.2%), "move" (1.6%), or "burner" (1.6%). See Table 4.

Table 4. Known name of the insect vector.

Vector name	%
Hello or allude	77.8
Gnat	12.7
Plague	3.2
Palomilla	1.6
Burner	1.6
Does not respond	3.2

Control methods and community perception

Fifty-four percent of respondents used at least one control method to avoid insect bites, and 46% did not use any method. Among the methods used, individual fumigation, awning, and incense are used in 47.1%, 8.8%, and 5.9%, respectively. Considering the combination of control methods, fumigation was the primary method practiced (85.3%), followed by the use of incense sprays (38.2%) and awnings (20.6%). Furthermore, the

combined use of fumigation and incense is the most frequent (26.5%), followed by fumigation, incense, and awning (5.9%), and fumigation and awning (5.9%). See Table 5.

Considering people's opinions on the best way to prevent leishmaniasis, 98.4% did not respond. However, when asked who should be responsible for controlling the disease, 85.7% of respondents stated that it is the responsibility of local and departmental health authorities, 82.5% considered it the obligation of the political sector, and 46% considered it a matter for the entire community.

Table 5. Methods used to control the insect.

Control method	%
Fumigation	47.1
Awning	8.8
Sahumerio	5.9
Fumigation/Sahumerio	26.5
Fumigation/Sahumerio/Awning	5.9
Fumigation/Awning	5.9

Family and community background

Forty-six percent of the people stated that they recently knew a family member or acquaintance with leishmaniasis, while 31.7% stated that they had known close cases in the past. Only 6.3% of those surveyed stated that a resident in their home had lesions compatible with cutaneous leishmaniasis.

The presence of animals associated with the home

Twenty-three percent of participants had at least two chickens in their home (although many did not have a chicken coop). Rams, pigs, and other species of birds were also found.

Regarding wild animals around homes, 66.7% of those surveyed stated that they had seen rats or mice in the last year, 25.4% observed opossums, 17.5% foxes, and 7. 9% sloth bears. Additionally, anteaters and armadillos were observed, both at 1.6%.

DISCUSSION

In Ovejas, Colombia, leishmaniasis is a disease mainly associated with rural areas. However, growing urbanization and the domestication of vectors have changed the transmission dynamics of this disease in urban areas[9,22].

In this study, the coverage of public services found through the surveys is close to the DANE information in energy services (98.6%), aqueduct (75.8%), sewage (89.3%), and natural gas (75.8%)[17]. In the cleaning service, the garbage situation is worrying since nearly 60% of homes do not have the service.

The high percentage of women surveyed and their large percentage of occupation in household chores could be linked to the fact that agriculture is the municipality's main economic activity[17]. This finding corresponds to the socio-cultural environment built in the families of this municipality, in which men are mainly dedicated to agriculture. At the same time, women remain at home most of the time.

Regarding the conditions of the homes and the environment, a risk of leishmaniasis was found in those who reside in the majority of homes with *Eternit* roofs surveyed (61.9%) since it has been reported in the peri-urban area of Ovejas that the roofs of *Eternit* are a risk factor concerning zinc roofs[5]. Additionally, only in homes with animals in the peridomicile do residents have protection against the disease since the insects would use sources of ingestion other than humans[5]. However, evidence of infection by parasites of the genus *Leishmania* in domestic canines and other recent studies in the municipality indicate that it is necessary to delve deeper into the role of peri-domiciliary animals as a potential protective factor, given that this could be counterproductive[7-9].

The general level of knowledge about the disease among those surveyed in the study area (74.6%) is lower than that found in other departments of the country, such as Huila, Chocó, and Santander, in which more than 85% of the population knows leishmaniasis[11,14,15]. However, when analyzing only the Caribbean region, the knowledge of CL in Ovejas (81%) is higher than what was found by Patiño-Londoño *et al*[13], in Tierralta (55%) and Valencia (52.5%) in the department of Córdoba, Colombia. This research showed that in other regions of the country where the population is affected by leishmaniasis, mainly due to the cutaneous form, the disease is widely known among

the inhabitants of these endemic areas compared to the municipalities of the Caribbean region.

Regarding knowledge of the vector in the urban area of Ovejas, although a high percentage of respondents said they knew it (77.8%), it is not ruled out that they may have confused it or associated it with the dengue vector since the pathogen that produces this disease is also transmitted by bite and has a high incidence in the municipality[5,23]. Thus, the fact that only 20.6% of those surveyed have identified at least three distinctive characteristics of insects of the genus *Lutzomyia* provides more approximate information about the knowledge of the leishmaniasis vector in the area under study. Likewise, the fact that 50% of those familiar with the vector did not associate it with the transmission of a disease agrees with what was found in two municipalities of Córdoba concerning the LC, where 85% of those surveyed did not consider it leishmaniasis as a vector disease13. This observation contrasts with the findings of Carrillo-Bonilla *et al*[10], in the municipality of Acandí (Chocó, Colombia), in which 80% of responders related this disease to the bite of an insect.

Regarding the lack of application of control measures by nearly half of the community, it is pertinent to highlight that the majority of those surveyed considered that the control of the disease is the responsibility of local and departmental political and health authorities. Therefore, the fact that a large percentage of people are indifferent to applying measures for self-protection and prevention is consistent with the discourse and perception adopted by the community regarding this disease, as has been demonstrated before in the Colombian Pacific[10]. About the above, the evaluation of the implementation of the Leishmaniasis Strategic Plan 2018-2022 in the country recognizes that there are barriers and challenges in the political positioning, comprehensive patient care, and the focus control plan[24,25], which makes interventions in these territories difficult and explains in a certain way the limitations that exist in the control of outbreak situations that have occurred in recent years.

Finally, the community's knowledge level about leishmaniasis, the vector, and the practices for its control reflect the limitations in the comprehensive management of this disease in the municipality, which is the main focus of leishmaniasis in the department of Sucre. In this sense, the present approach to the KAP on leishmaniasis in the urban area of the municipality of Ovejas offers the opportunity to design strategies that promote its prevention and control, whose activities should focus on educating the population to encourage the adoption of practices aimed at to interrupt domestic transmission cycles.

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STATEMENT ON CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

CONTRIBUTION OF THE AUTHORS

The **first author** participated in the study's conceptualization and design, data collection, statistical analysis, bibliographic review, writing, and final approval of the manuscript.
The **second author** conducted data collection, statistical analysis, writing, and final approval of the manuscript.
The **third author** conducted data collection, wrote the manuscript, and gave the final approval.
The **fourth author** participated in study design, instrument validation, writing, and final approval of the manuscript.
The **fifth author** participated in the study design, instrument validation, writing, and final approval of the manuscript.

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