

## EPIDEMIOLOGICAL PROFILE OF VISCERAL LEISHMANIASIS X HIV CO-INFECTION IN THE STATE OF PARÁ FROM 2018 TO 2022



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## ABSTRACT

Visceral Leishmaniasis (VL), the most severe form of the disease, when associated with HIV, has a high mortality rate due to immunosuppression, which increases the patient's vulnerability to opportunistic infections, relapses and therapeutic failures. Using data from the Notifiable Diseases Information System (Sinan-Net), the study analyzed 1.495 cases of VL between 2018 and 2022, evaluating variables such as gender, age group, race, education, and clinical evolution, with the data processed in Microsoft Excel. The results indicated a predominance of Cutaneous Leishmaniasis (TL), which represented about 90% of the reported cases, however, the data do not show an association with HIV. Only VL showed results associated with HIV. Coinfection was more common in men of brown ethnicity, adults of working age and with low schooling, suggesting greater occupational exposure in risk areas and reflecting socioeconomic inequalities. Most of the coinfected patients were diagnosed by laboratory methods, which contributed to relatively high cure rates. However, coinfected patients had higher mortality compared to HIV-negative patients, with deaths directly associated with VL or indirect causes. In addition, an initial downward trend was noted in the number of reported VL cases until 2021, followed by an increase in 2022, which suggests possible changes in the epidemiological dynamics of the disease. Coinfection worsens the clinical outcomes of both conditions, making therapeutic management difficult. HIV-induced immunosuppression intensifies the severity of VL, while Leishmania infection accelerates immune decline in HIV patients. In summary, the study reinforces the strategic role of SINAN as a tool for epidemiological monitoring and formulation of health policies, contributing to the understanding of the dynamics of LV-HIV co-infection in Pará. The analysis emphasizes that effective coping requires integrated approaches that consider not only biological factors, but also social and structural factors, to achieve greater equity in health care.

**Keywords:** Disease. Epidemiology. Treatment.

## INTRODUCTION

Leishmaniasis is considered a neglected disease, being a serious public health problem (Vasconcelos; Kovaleski; Junior, 2015). According to the World Health Organization, it is estimated that 700,000 to 1 million cases of leishmaniasis occur annually. There are three main forms of leishmaniasis: visceral which is the most severe form, cutaneous the most common and mucocutaneous which affects the mouth, nose and throat. People living with HIV who are infected with leishmaniasis are highly likely to develop the severe form of the disease, with high rates of relapse and mortality (PAHO, 2023).

In epidemiological terms, about 350 million people are exposed to the risk of contracting the disease, with approximately two million new cases registered annually in its different clinical forms. The disease is present in 98 countries, distributed across five of the six continents, but its notification is mandatory in only 30 of these countries (PAHO, 2023). In the Americas, the annual average of cases in the last five years was approximately 2,850, 93% of which occurred in Brazil (PAHO, 2023). In Brazil, there is an upward trend in cases of co-infection due to problems in diagnosis and treatment (De Souza Filho et al., 2023).

Leishmaniasis is a zoonosis caused by different species of the genus *Leishmania*, being transmitted by the bite of infected female sandfly mosquitoes. Once infected, drug treatment is initiated, with the most commonly used drugs being meglumine antimoniate and amphotericin B (Laniado-Laborín and Cabrales-Vargas, 2009; Baginski and Czub, 2009). It should be noted that in the case of leishmaniasis and HIV co-infection, treatment is challenging and the response can be reduced in the event of recurrences, since there is an interaction between these conditions that affects the patient's immune response (Rodrigues et al., 2024).

In the case of visceral leishmaniasis and HIV, the treatment of choice is liposomal amphotericin B, due to its efficacy and lower toxicity compared to other options (Laniado-Laborín and Cabrales-Vargas, 2009; Baginski and Czub, 2009). Unfortunately, people living with HIV/AIDS are still stigmatized and victims of prejudice, which can negatively impact adherence to antiretroviral therapy (ART) treatment. In this way, the viral load increases, the levels of CD4+ lymphocytes reduce, the immunological condition is compromised and the patient may present opportunistic infections of viral, bacterial and parasitic origin, such as leishmaniasis (Rodrigues et al., 2024). However, there is still a lack of studies that analyze

the epidemiological data of this association between HIV and leishmaniasis, as well as propose intervention strategies. Thus, the objective was to evaluate the epidemiological profile of visceral leishmaniasis x HIV co-infection in the State of Pará from 2018 to 2022.

## METHODOLOGY

This is a quantitative descriptive study in which 1495 cases of Visceral Leishmaniasis in the State of Pará, located in the northern region of Brazil, as well as cases of VL and HIV co-infection in that locality, were analyzed from 2018 to 2022. Data were obtained from the Notifiable Diseases Information System (Sinan-Net), of the Ministry of Health. The variables analyzed were: gender, age group, race, education, confirmation criterion and evolution. The data were stratified and interpreted using the Microsoft Excel computer program.

## RESULTS

Between the years 2018 and 2022, according to the Ministry of Health's Sinan-Net, the number of reported cases of leishmaniasis in the state of Pará had a downward trend until 2021, with an increase in 2022. In all the years evaluated, there was a predominance of the integumentary form, and cases of visceral leishmaniasis were reported in HIV-negative patients and patients with HIV (Table 1). However, in this system there is no information on whether there was co-infection with tegumentary leishmaniasis and HIV, and it is not possible to relate whether the households of those infected are located in rural or urban areas.

Table 1: Number of leishmaniasis cases and their relationship with HIV in the State of Pará.

Variable	Anus				
	2018	2019	2020	2021	2022
Nocases	3807	3611	3372	2789	3208
Leishmaniasis					
-Integumentary	3228	3264	3141	2609	3050
-Visceral	579	347	231	180	158
Coinfection	13	11	13	24	24
Leishmaniose + HIV					
-Integumentary	NOR	NOR	NOR	NOR	NOR
-Visceral	13	11	13	24	24

Legend: NI- not informed. Source: Adapted from Sinan-Net, 2024.

During the period investigated, there was a predominance of infected and co-infected individuals in the brown ethnic group (Table 2). In all the years analyzed, there was a predominance of leishmaniasis in the working age (Table 2). An important and largely

absent piece of information is the education level of the users notified with leishmaniasis, but most of the interviewees did not even complete high school (Table 2).

Table 2: Data on patients with visceral leishmaniasis and coinfection.

Variables	Years									
	2018		2019		2020		2021		2022	
	HIV-	HIV+	HIV-	HIV+	HIV-	HIV+	HIV-	HIV+	HIV-	HIV+
<b>Ethnic group</b>										
White	38	1	32	0	17	1	11	1	113	1
Brown	447	10	265	7	168	10	121	21	1147	22
Black	47	2	25	3	22	2	16	2	130	0
Yellow	4	0	2	0	1	0	1	0	8	0
Indigenous	2	0	4	0	1	0	1	0	14	0
Unknown	28	0	8	1	9	0	6	0	59	1
<b>Age group</b>										
<1 year	63	0	46	0	21	0	17	1.	12	0
1-4 years	170	2	89	0	45	0	27	0	26	0
5-9 years	69	0	28	0	17	0	7	0	12	0
10-14 years	31	1	26	0	11	0	8	0	13	2
15-19 years	33	0	29	0	13	0	12	0	12	1
old	115	7	58	7	65	6	43	5	40	14
20-39 years	62	3	38	3	35	7	32	18	25	6
40-59 years	8	0	9	0	7	0	3	0	7	0
old	1	0	5	1	2	0	1	0	3	0
60-64 years	10	0	7	0	0	0	6	0	5	1
old	4	0	1	0	2	0	0	0	3	0
65-69 years										
70-79 years										
≥80 years old										
<b>Schooling</b>										
Illiterate	11	1	5	0	7	1	7	0	3	1
Incomplete	58	2	29	2	22	5	11	6	13	2
EF1	13	0	10	0	11	1	9	3	6	1
EF1 Complete	57	3	38	2	27	0	18	1	13	3
EF2	15	0	14	1	4	0	7	1	5	5
incomplete	21	0	9	2	13	0	8	2	5	4
EF2 Complete	31	0	17	3	16	3	12	3	18	1
Incomplete	1	0	0	0	1	0	0	0	0	0
MS	3	0	1	0	4	0	0	0	0	0
IN full	356	7	202	12	113	3	84	8	71	7
It IS										
incomplete										
EScompleto										
NO										
<b>Sex</b>										
Female	197	3	142	2	84	7	61	6	47	10
Male	369	10	194	9	134	6	95	18	87	14

Source: Adapted from Sinan-Net, 2024.

Most patients were diagnosed through laboratory tests (Table 3). Regarding the evolution of the disease, most patients were cured of VL, with a significant cure rate among HIV-VL patients (Table 3).

Table 3: Diagnosis of VL and clinical evolution of the patient.

Variables	2018		2019		2020		2021		2022	
	HIV-	HIV+								
Confirmation Laboratory	514	11	297	10	189	12	135	17	105	17
Clinical-epidemiological	52	2	39	1	29	1	21	7	29	7
<b>Evolution</b>										
Care	406	3	251	9	154	7	125	16	116	20
Abandonment	2	1	1	0	2	1	2	0	2	0
Obito LV	42	2	18	0	12	0	19	4	8	0
Death other cause	19	4	4	0	16	5	6	2	2	1
Transfer	23	2	15	1	7	0	3	0	5	1
NO	87	1	58	1	40	0	25	2	25	2

Source: Adapted from Sinan-Net, 2024.

## DISCUSSION

Leishmaniasis is endemic on five continents, with an annual incidence of between 200,000 and 400,000 cases per year, mainly in countries such as Bangladesh, India, Sudan, South Sudan, Ethiopia and Brazil. However, these numbers do not reflect the reality of the pathology, as several countries do not have compulsory notification or financial difficulties of underdeveloped countries (Alvar et al., 2012). The predominance of tegumentary leishmaniasis is expected, accounting for about 90% of diagnosed cases, due to the higher frequency in rural and forest environments and prevalence of the vector (BRASIL, 2017).

The association of leishmaniasis with HIV can occur in all clinical manifestations of leishmaniasis, and there is no definition of a clinical profile that can be indisputably associated with co-infection. However, both modify the progression to worsening of the clinical condition. There was a limitation of the data made available by SINAN in cases of co-infection of tegumentary leishmaniasis and HIV, limiting the discussion to cases of visceral leishmaniasis and HIV (De La Salud, 2023) (Table 1).

In Pará, the ethnic predominance is of Brown people, about 69.9% of Pará people declare themselves brown, being the ethnicity most affected by co-infection (IBGE, 2022). Visceral leishmaniasis mainly affects children and adolescents who enter the forests, becoming targets of the vector (Table 2) (Barbosa et al., 2013). However, it was found that the highest number of cases of coinfection were in male patients and adults with a school education of up to high school, due to greater exposure at work (Souza et al., 2020).

Most patients progress to cure, however, co-infection results in increased treatment failure, with an increase in the mortality rate (Table 3) (Souza et al., 2020). Therefore, laboratory diagnosis of HIV and VL decreases the chances of mortality (Table 3) (Gomes et al., 2011; BRAZIL, 2015).

Early identification is essential to reduce severity and mortality in patients with co-infection. Thus, suspected or confirmed cases of *Leishmania-HIV* co-infection should be referred to referral centers specialized in the follow-up of people with leishmaniasis. Understanding the epidemiological dynamics of VL and HIV/AIDS is essential to promote health education actions, considering that misinformation, prejudice and stigma are one of the main risk factors associated with these diseases. In the state of Pará, this approach is crucial to prevent HIV-VL co-infection. In addition, it is important to make HIV serological tests available to patients with leishmaniasis, aiming at early detection. In addition, educational campaigns to promote safe sex, especially in rural and forest regions in the northern region of Brazil, are essential to reduce HIV and co-infection (Costa et al., 2021). Furthermore, in leishmaniasis, the screening of sick dogs is essential to control the disease, as is the vaccination of dogs.

## CONCLUSION

The research showed a predominance in cases of Cutaneous Leishmaniasis, however, but the most severe form associated with HIV is visceral leishmaniasis. Cases of co-infection are more common among children, adolescents and adults of working age. Diagnosis and treatment seem to have been adequate due to the high cure rates. However, patients with HIV (positive) compared to HIV patients (negative) had more cases of deaths from the disease or another unknown cause. Therefore, this study corroborates the importance of SINAN as a tool to assist the Ministry of Health in the evaluation and coping with patients with visceral leishmaniasis and HIV.

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