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Original article

Epidemiological profile of hospitalizations for visceral leishmaniasis in the state of Bahia, from 2010 to 2022

Perfil epidemiológico de internamentos por Leishmaniose Visceral no estado da Bahia, período de 2010 a 2022

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Resumo

Objetivo: avaliar o perfil epidemiológico das internações por leishmaniose visceral (LV) na Bahia, no período de 2010 a 2022. **Material e Métodos:** estudo descritivo e retrospectivo, obtido através dos registros do Sistema de Internamento Hospitalar (SIH), disponíveis no Departamento de Informática do Sistema Único de Saúde (DATASUS) referentes aos internamentos por essa doença no Brasil, no período de 2010 a 2022, por local de residência. **Resultados:** foram registrados 2.355 internamentos na Bahia. Houve concentração na macrorregião de saúde centro-leste (8,0%) e na região de saúde de Irecê (16%). A população acometida foi caracterizada por pessoas do sexo masculino (56,2%), na faixa etária de 1 a 4 anos (15,9%), de cor parda (37,9%). O caráter do atendimento foi de urgência (93,3%), o regime foi público (45,1). As hospitalizações geraram gastos e o valor total foi de R$ 1.323.866,7, sendo o valor médio por atendimento de R$ 563,65, com tempo médio de permanência de 15,3 dias. **Considerações finais**: é necessária a elaboração de políticas públicas que fortaleçam a vigilancia, prevenção e controle da LV. Adicionalmente, evidenciou-se a necessidade de ações integradas entre vigilância em saúde e assistência, para fomentar a suspeição precoce da doença pelas equipes de atenção básica nas regiões de concentração desta.

Palavras -chave: Leishmaniose Visceral. Hospitalização. Epidemiologia. Saúde Pública.

Abstract

Objective: Between 2010 and 2022, we aimed to evaluate the epidemiological profile of hospitalizations for visceral leishmaniasis(VL) in Bahia. **Material and methods:** The present study is a descriptive and retrospective investigation utilizing records from the Hospital Admission System (SIH), which is accessible from the Department of Information Technology of the Unified Health System (DATASUS), about hospitalizations for this disease in Brazil between 2010 and 2022, categorized by place of residence. **Results:** 2,355 hospitalizations were recorded in Bahia. There was a concentration in the central-eastern health macro-region (8.0%) and in the Irecê health region (16%). The affected population was predominantly male (56.2%), aged between 1 and 4 years (15.9%), and brown (36.7%. The type of care was urgent (93.3%), and the system was public (45.1%). Hospitalizations generated costs, and the total value was R$1,323,866.7, with the average value per visit being R$563.65, with an average length of stay of 15.3 days. **Final considerations:** public policies need to be drawn up to strengthen the surveillance, prevention, and control of VL. In addition, there is a need for integrated actions between health surveillance and care to encourage early suspicion of the disease by primary care teams in the regions where it is concentrated.

Keywords: Visceral Leishmaniasis; Hospitalization; Epidemiology; Public Health.

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Introduction

Visceral leishmaniasis (VL) is a chronic and systemic disease caused by protozoa of the genus *Leishmania infantum* and, when left untreated, can be fatal in 90% of cases. It is transmitted by the female insect *Lutzomyia longipalpis* (the main vector in Brazil), which inoculates the host's bloodstream with leishmania, an obligate intracellular protozoan. The dog is the main domestic reservoir of leishmania and, in the wild, edentates, marsupials, and rodents[1].

The main clinical manifestations of VL are prolonged fever, pancytopenia, hepatosplenomegaly, weight loss, pallor, and anemia. In more severe clinical cases, coughing, vomiting, diarrhea, and hemorrhagic phenomena are possible[2]. This disease can be treated free of charge by the Brazilian Unified Health System (SUS). The drug of choice is N-methyl glucamine, except in some situations where the use of liposomal amphotericin B is recommended as a priority[2].

According to the Ministry of Health[3], VL is endemic in 76 countries, and on the American continent, it has been described in at least 12. Of the cases registered in Latin America, 90% occur in Brazil. Since 1913, when the first case was described in Brazil, in the state of Mato Grosso, the disease has been described in various Brazilian municipalities. From that time to the present, there have been important changes in the pattern of transmission, which initially occurred in wild and rural environments when it was categorized as a rural endemic. More recently, it has been detected in urban centers due to migration to cities and adaptation of the vector. In Brazil, around 3,500 cases are recorded every year, and the incidence rate is 2.0 cases per 100,000 inhabitants.

The state of Bahia is endemic to the disease, with a wide distribution and significant magnitude. According to data from the Bahia State Health Department (SESAB), 4,098 new confirmed cases of the disease were recorded between 2008 and 2020, with the highest incidence coefficient in 2014, which showed 3.4 cases per 100,000 inhabitants[4].

Considering that VL has a wide distribution and is expanding rapidly in the state of Bahia, surveying the epidemiological profile of hospital admissions over time has the potential to reveal important characteristics of the disease, making it possible to develop preventive and control actions more effectively.

This study aimed to assess the epidemiological profile of hospitalizations for VL in Bahia between 2010 and 2022.

Materials and Methods

This is an epidemiological, descriptive, and retrospective study, with data obtained from hospitalization records in the Hospitalization System (SIH, in Portuguese), available on the website of the Department of Informatics of the Unified Health System (DATASUS, in Portuguese)

regarding hospitalizations for VL in Bahia, from 2010 to 2022. The data was collected in May 2023. There was no sample size calculation because a time frame was set for the occurrence of cases.

The data was collected from records obtained from DATASUS, provided in spreadsheet format. On the DATASUS website, hospital production records were collected and extracted from hospitalization authorization (AIH) data, reduced (RD) by place of residence, from 2010 to 2022. The following variables were analyzed: absolute number and percentage of admissions per year, age group, gender (male and female), color/race, health macro-region, health region, establishment regime (private or public), type of care (elective or emergency), length of stay and expenditure on the system.

Regarding the DATASUS search for hospitalizations, those available on the site were collected, with the main diseases categorized by the International Statistical Classification of Diseases and Related Health Problems, version 10 (ICD-10) of those present in the results of this research: B55.0 (visceral leishmaniasis). ICD b55.1 (cutaneous leishmaniasis), B55.2 (mucous cutaneous leishmaniasis), and B55.9 (unspecified leishmaniasis) were discarded.

The absolute (*n*) and relative (%) distribution of categorical variables and measures of dispersion and central tendency of numerical variables were carried out.

Ethical precautions

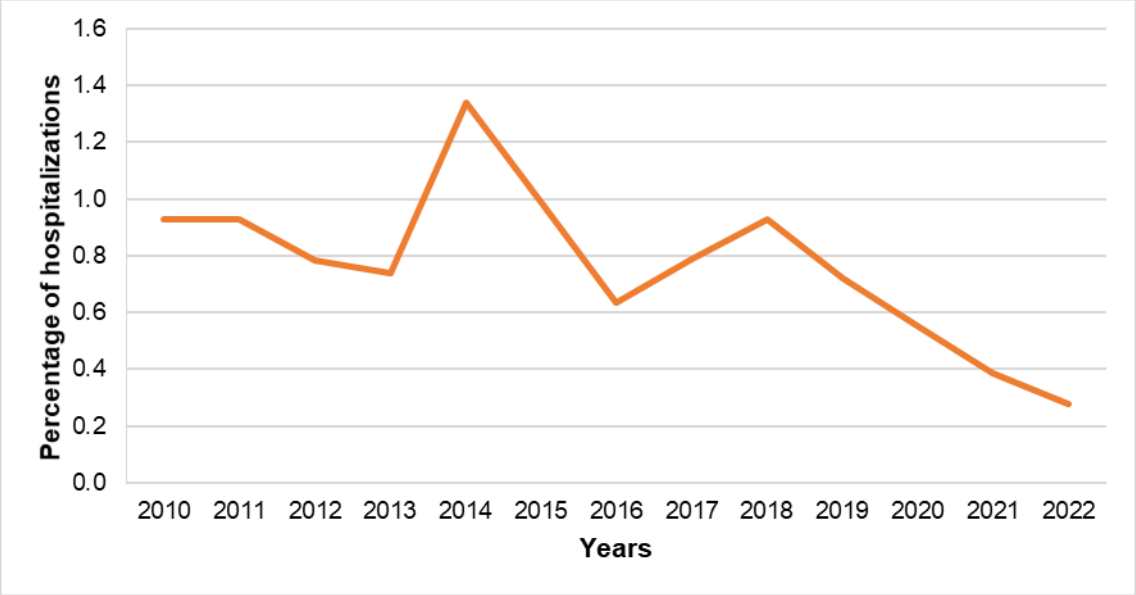
As this was a study using secondary data from a national database (DATASUS), the study was exempt from submission to a Research Ethics Committee, with due observance of the ethical aspects contained in two Resolutions of the National Health Council: CNS (in Portuguese) No. 466, of December 12, 2012, and CNS No. 510, of April 7, 2016.

Results

Between 2010 and 2022, there were 2,355 hospitalizations caused by VL in Bahia. According to the historical series, the years with the highest percentage of hospitalizations were 2014 (316/2,355; 13.1%), followed by 2015 (233/2,355; 9.9%) (Figure 1).

In the period analyzed, regarding the distribution of hospitalizations by health macro-region, it can be seen that VL hospitalizations were recorded in all nine health macro-regions, with a predominance in the Central-Eastern health macro-region (22.2%), followed by the Central-Northern macro-region (20.1%) and then the South-Western macro-region (17.2%) (Table 1).

Figure 1. Percentage of hospitalizations due to visceral leishmaniasis in Bahia, between 2010 and 2022.



Source: DATASUS, 2023.

Table 1. Absolute number and percentage of hospitalizations for visceral leishmaniasis, according to health macro-region of residence in Bahia, between 2010 and 2022.

Health macro region	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total	%
South	7	9	9	4	8	12	6	8	7	4	1	1	1	77	3.3
Southwest	29	31	28	31	57	45	30	45	33	25	23	20	8	405	17.2
West	7	5	6	17	19	18	15	35	40	18	22	9	13	224	9.5
North	24	17	11	18	44	25	19	26	25	12	15	16	8	260	11.0
Northeast	9	13	12	4	13	6	5	1	8	5	7	3	3	89	3.8
East	39	53	33	29	25	7	12	22	32	26	14	8	3	303	12.9
Far South	-	-	-	-	-	-	1	-	-	-	-	-	-	1	0.0
Central East	50	43	48	41	88	45	23	29	49	44	26	20	16	522	22.2
Central North	54	48	37	30	62	75	38	20	25	36	22	14	13	474	20.1
Total	219	219	184	174	316	233	149	186	219	170	130	91	65	2355	100

Source: DATASUS, 2023.

In the Central-Eastern health macro-region, the Feira de Santa health region stands out as having the highest percentage, with 188 hospitalizations (8.0%). When disaggregating the data by health region, a different scenario can be observed, as the highest percentage of hospitalizations was recorded in the Irecê health region, which belongs to the Central-North health macro-region, recording 344 hospitalizations (16%). Table 2 shows the ten health regions with the highest percentage of hospitalizations.

Table 2. Absolute number and percentage of hospitalizations for visceral leishmaniasis, by health region of residence in Bahia, between 2010 and 2022.

Health Region	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total	%
Irecê	44	37	27	23	50	62	28	18	20	30	16	10	11	376	16.0
Juazeiro	21	9	8	18	38	20	14	22	21	12	10	14	8	215	9.1
Feira de Santana	18	17	26	12	24	13	12	13	26	12	6	7	2	188	8.0
Brumado	15	13	12	11	27	26	13	15	16	13	13	8	3	185	7.9
Guanambi	9	15	11	17	15	15	13	15	10	12	4	7	3	146	6.2
Itaberaba	7	10	7	20	49	17	6	5	7	7	6	2	-	143	6.1
Serrinha	21	10	13	5	10	1	4	7	14	25	11	9	11	141	6.0
Salvador	7	16	17	11	19	2	9	10	13	14	6	4	3	131	5.6
Jacobina	10	11	10	7	12	13	10	2	5	6	6	4	2	98	4.2
Santa Maria da Vitória	2	2	-	3	7	4	6	12	26	10	12	5	9	98	4.2

Source: DATASUS, 2023.

As for the type of care and regime, 2,198 (93.3%) of the admissions were urgent, with 1,063 registered under the SUS regime (45.1%). The total amount spent was R$1,323,866.7, and the average amount per visit was R$563.65, with an average length of stay of 15.3 days.

Regarding the sociodemographic characteristics of those hospitalized, there was a predominance of males (94.7%), children under five (33.8%), and brown people (36.8%) (Table 3).

Table 3. Visceral leishmaniasis hospitalizations, according to socioeconomic characteristics, Bahia, 2010 to 2022.

Variables	n	%
Gender		
Male	2230	94.7
Female	1368	58.1
Group age (years)		
Less than 1 year	114	4.8
1 to 4	795	33.8
5 to 9	334	14.2
10 to 14	187	7.9
15 to 19	140	5.9
20 to 29	201	8.5
30 to 39	199	8.5
40 to 49	160	6.8
50 to 59	110	4.7
60 to 69	69	2.9
70 to 79	29	1.2
80 and over	17	0.7
Race/color/		
White	63	2.7
Black	83	3.5
Brown	867	36.8
Yellow	22	0.9
Indigenous	1	0.0
No information	1,319	56.0

Source: DATASUS, 2023.

Discussion

According to the results, it can be seen that, between 2010 and 2022, the predominance of hospitalizations for VL in Bahia was among males, in the 1-4 age group, of brown race. The state's health macro-regions that concentrated hospitalizations were the Central-East, Central-North, and Southwest. The hospitalization regime was SUS and emergency; the time spent was 15.3 days, and the average amount spent was R$ 563.65.

Concerning age group, similar data was found in a study carried out in the north of Minas Gerais, between 2006 and 2007[5], which evaluated hospitalizations of people aged 0 to 12 hospitalized with VL, showing that 74.5% of cases of hospitalization for VL were of children under five, out of a sample of 51 children. Another study, also carried out in the north of Minas Gerais between 1999 and 2016[6], which assessed 967 people hospitalized with VL, showed that the main age group was 1 to 4 years old (42.9%). In a study carried out in Pernambuco7, of the 431 children aged up to 14 hospitalized with VL, 68.2% were under 5 years old. In the state of Mato Grosso do Sul, 69.9% of cases of the disease occurred in the first five years of life.

There was agreement with the literature regarding the concentration of hospitalized cases in children under 5 years of age. This may be associated with the thematic focus of the articles found, most of which focused on the hospitalized pediatric age group. However, a study carried out at a university hospital in Minas Gerais[6], which evaluated the medical records of hospitalized people but did not cut by age group, also found a concentration of hospitalizations of children under 5 years old. This finding may be justified by the high incidence of VL in this age group, as the reason for children's greater susceptibility is explained by their relatively immature immune cells, aggravated by malnutrition, which is so common in endemic areas, as well as greater exposure to the vector in the peridomicile[1,4,7-9].

In the results obtained through this study, it was possible to observe a predominance of males, which corroborates the literature, which recognizes that males are more susceptible to illness[1,4,6,8,9]. However, two studies[5,7] disagreed with these findings, as male and female children were equally affected by the disease.

Concerning the race/skin color of the people affected, brown people were predominant, but no study has looked at this variable, which made it difficult to discuss the findings. The predominance of hospitalizations among people of this color may be justified by the proportion of the disease in this population group, a fact that can be seen in the epidemiological bulletins for the state of Bahia[4,10-12]. Also, regarding the race/color variable, in 56% of cases, this data was ignored. Studying the race/color variable is also a social variable that can represent an important conditioning and/or determining factor for discrepancies in access to health services between racial groups[12].

The results of this study indicated that the health macro-regions of Bahia with the highest percentage of hospitalizations were Central-East, Central-North, and Southwest. There is still little literature correlating the distribution of VL cases and the administrative areas of the state of Bahia. However, it is possible to justify this result with the data found in the epidemiological bulletins of the state of Bahia, which indicated that these health macro-regions concentrate the number of VL cases in the state, corroborating the findings of this study[4,10,11,13].

Based on the principle that for VL to establish itself in the environment, there needs to be an interaction between vector, environment, and host[1], climatic and environmental factors can influence the occurrence and maintenance of the endemic in certain Brazilian regions. It is therefore important to carry out studies correlating climatic factors with the morbidity and mortality of the disease. The study carried out in Minas Gerais[6] evaluated the relationship between climate and the occurrence of VL, but found no statistically significant association between environmental and climatic factors and the increase in the number of cases.

The studies did not evaluate the hospitalization regime or the nature of the hospitalization. As for the length of stay, the studies presented different results, ranging from 10 to 120 days of hospitalization[5-7,14-16]. An important finding of this study was the number of hospitalizations for VL in children under 5 years old. Given this, studies and the development of public policies aimed at health care for this age group are important.

Because of the magnitude and transcendence associated with the increase in lethality in patients affected by VL in Brazil, in 2011[17] the Ministry of Health published a manual with clinical recommendations for reducing lethality. This manual created a prognosis system and listed the main risk factors that could lead to the death of a VL patient. It is a decision matrix based on the classification of the degree of recommendation, based on the evidence-based medicine centers of the National Health Service in England, to define the risk factors associated with death from VL[17,18]. This manual also clarifies that, except for a few cases, people who fall ill with VL can be treated in Primary Health Care (except in a few cases), as long as there is early suspicion and appropriate treatment of the patient. In this way, manuals and guidelines similar to this one can avoid hospitalization for these patients and, consequently, reduce their morbidity and mortality.

The results of this study should be considered in light of some limitations. Secondary data were used, and the system used for collection does not offer variables for evaluation, such as the drug used for treatment and the area of residence of the patients. In addition, although the disease is endemic in Bahia, no studies were found that evaluated the hospitalization profile, nor were there any articles describing the epidemiological profile of the disease in Bahia. On this last subject, only epidemiological bulletins written by the State Health Department were found. Despite its limitations, this article could support further research in the area.

The magnitude of VL is not linked to its high incidence, wide distribution, or the possibility of people developing severe and lethal forms of the disease[19]. It is, therefore, necessary to develop public policies that strengthen the integration between Health Surveillance, especially the epidemiological surveillance component, and Health Care (primary care), to effectively promote prevention and health promotion, avoiding the occurrence of disease, severe cases, hospitalizations, and deaths.

Epidemiological surveillance has the essential role of monitoring the trend of cases, delimiting areas of transmission in municipalities, and providing epidemiological data to contribute to the composition of a quality health network. In addition to the development of measures to promote suspicion, early diagnosis, and appropriate clinical and therapeutic management in primary care.

In this context, the complexity of VL control requires primary care to be integrated into disease prevention and control actions within the territory, effectively functioning as the gateway to the SUS, with comprehensive care, coordination, and continuity of care, avoiding serious cases and, consequently, the need for hospitalization[20].

Conclusion

The hospitalization profile of patients affected by VL in Bahia is male, between the ages of 1 and 4, of brown race, and concentrated in three of the state's health macro-regions. It was also observed that the length of stay of patients is long, with an average of 15.3 days, generating costs for the SUS.

VL is a complex disease. To reduce the number of severe cases, hospitalizations, and deaths, further work is needed to contribute to the diagnosis of health in the health macro-regions of Bahia, involving health, geography and socio-economic factors in people affected by VL, to prevent the disease from occurring.

The number of hospitalizations for VL reinforces the need to organize local health systems. It is essential to train and update health professionals to organize local systems, for early suspicion and clinical-therapeutic management, starting with primary care.

Another important tool is health education with the community, making it possible for users to take the lead in their care and to know how to recognize the vector, how to avoid the disease and how to access the system when necessary.

Authors´ contributions

The author approves the final version of the manuscript and declares herself responsible for all aspects of the work, including ensuring its accuracy and integrity.

Conflict of interest

The author declares no conflicts of interest.

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