Chapter 131

Epidemiological profile of Visceral Leishmaniasis in northeastern Brazil from 2009 to 2019

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ABSTRACT
Objective: This is a retrospective epidemiological study, with a quantitative and qualitative approach, which aimed to describe the epidemiological profile of visceral leishmaniasis (VL) in the northeast from 2009 to 2019.
Methods: The selected variables' number of cases by state, age group, sex, ethnicity, confirmation criteria, education, HIV co-infection, municipality of infection, municipality of notification, and evolution, were obtained through the Disease Information System of Notification (SINAN). A descriptive analysis of the data was performed, and a comparison was made between the years.
Results: The state of Maranhão leads as the state with the highest number of cases since 2015. There was a significant reduction in reported cases in the last year, however, it remains in the range between 1500 to 2500 cases. The brown race, being the predominant race in Brazil, has the highest number of cases among ethnic groups. The age group predominantly affected by VL is distributed between 0 to 14 years. 64.87% of cases progressed to cure.
Conclusion: Although visceral leishmaniasis offers a real risk to public health, the disease remains extremely neglected, requiring new control measures to eliminate transmission and prevent a new epidemic.

Keywords: Visceral leishmaniasis in the northeast. Epidemiological profile. Socioeconomic Factors.

1 INTRODUCTION

Visceral Leishmaniasis (VL), also known as Kala-azar, is a chronic tropical disease, considered by the World Health Organization (WHO) as one of the five neglected diseases that have priority to be eliminated, due to its high rate of morbidity and mortality, which can lead to death in up to 90% of cases not treated correctly (ALMEIDA et al., 2020). In addition, this pathology is caused by protozoa of the Trypanosomatidae family and the genus Leishmania is transmitted during the blood meal by inoculation of the parasite through the bite of an infected female sand fly Lutzomyia longipalpis (DA SILVEIRA, DE OLIVEIRA, 2020).

Furthermore, in Brazil, suspected and confirmed cases of Visceral Leishmaniasis must be reported to the Notifiable Diseases Information System (SINAN) and may have their epidemiological investigation initiated within 48 hours (ALMEIDA et al., 2020). The diagnosis of VL is of paramount importance so that immediate treatment can be initiated, using pentavalent antimonials or amphotericin B. Usually, this confirmation is carried out by culturing the parasite originating from infected cells obtained from spinal cord puncture or biopsy of the patient's skin (JUNIOR et al., 2020). Visceral Leishmaniasis is characterized by a broad clinical spectrum, emphasizing asymptomatic or oligosymptomatic forms of the disease, as well as classic acute manifestations such as hepatosplenomegaly, anemia with leukopenia and a state of progressive weakness that can be lethal (SOUZA et al., 2020).

VL has 40,326 notifications in Brazil from 2009 to 2019, it is known that it had a rural character, but in recent years it has expanded to medium and large urban areas. Considering that VL belongs to the group of neglected tropical diseases, responsible for a serious public health problem, it is vital to understand and discuss the data available at SINAN, which may help in the planning of prevention policies and specific therapeutic care for the vulnerable population. (ORTIZ 2012; ROCHA, 2018).

The general objective is to survey the main epidemiological characteristics and sociodemographic data of visceral leishmaniasis in northeastern Brazil from 2009 to 2019.

2 MATERIAL AND METHODS

This is a descriptive and retrospective epidemiological study whose data were collected by consulting the Notifiable Diseases Information System (SINAN) from 2009 to 2019.

All sociodemographic and epidemiological data available in the notification system were collected, including age, sex, race/ethnicity, education, case evolution, municipalities of infection, municipalities of notification, and HIV co-infection.

The collected data were organized in an Excel spreadsheet according to the year of notification and the graphs from figures 1 to 7 were made in the GraphPad Prism program, version 8.4.3. Cases registered in the system cannot be identified by individuals as only the absolute number of cases is provided. Therefore, no individual has been or will be identified, which guarantees privacy and anonymity.

3 RESULTS

About other data from SINAN, concerning municipalities infected by Visceral Leishmaniasis, the states of the Northeast are listed as major contributors to the permanence of the disease's endemic disease. In the state of Pernambuco, the cities of Petrolina, Ouricuri, and Serra Talhada are relevant with 105, 60, and 43 confirmed cases, respectively. In Alagoas, the municipalities of Palmeiras dos Índios, São José da Tapera, and Estrela de Alagoas stand out with 52, 32, and 29 cases of infection, respectively.

In addition, in Paraíba, the municipalities of Sousa, João Pessoa, and Cajazeiras were highlighted with 35, 28, and 23 cases, in that order. Finally, Sergipe has its capital Aracaju with 275 cases of the disease and the cities of Nossa Senhora do Socorro and São Cristóvão with 49 and 37 cases each, thus alarming the neglect of the disease in the Northeast region of the country.

Regarding sex, it was evident that in the analyzed period, the State of Pernambuco had a total of 918 men and 487 women while in the State of Alagoas there were 340 men and 163 women, in Maranhão there were 4068 men and 2267 women, in Maranhão, the data were from 3616 men and 1694 women, the measure in which in Bahia men occupied the quantitative of 1319 and women 459, in Piauí a total of 1526 men was obtained for 733 women, while in the Rio Grande do Norte we had 714 men and 320 women, in Paraíba we had 302 men and 158 women and in Sergipe we had 491 men and 204 women.

Regarding HIV co-infection, it is possible to state that the states of Maranhão and Ceará lead in the number of cases, with 572 and 492 cases, respectively. In Piauí and Rio Grande do Norte, the numbers decrease, with 278 and 191. Finally, in decreasing order of the number of cases, the states of Pernambuco, Paraíba, Sergipe, Alagoas, and Bahia had the lowest number of cases of co-infection, ranging from 93 to 8 cases in each state.

When analyzing qualitatively, the percentage of co-infection in each region was calculated and it was observed that Rio Grande do Norte, with 18.5%, presented the highest percentage among the states studied. Concomitantly, the state of Bahia had the lowest percentage, with 0.8% of cases of Visceral Leishmaniasis presenting co-infection with HIV.

4 DISCUSSION

In an initial analysis, as shown in Graph 1, it is important to point out that although the states are part of the same region, Ceará, Maranhão, Bahia, and Piauí have the highest rates of VL cases in the analyzed period, in the same way, that 2017 had Maranhão as the city with the highest number of cases, reaching the range of 800 cases, while Piauí in that same year had the lowest number since it did not reach even 300 cases. From this perspective, it is important to assess that factors such as urbanization have made the endemic areas of VL expand into urban areas, thus, this disease is responsible for huge public expenditures, both in terms of prevention and control and in the treatment of those affected. by the disease (CERBINO NETO, 2003).

It is also worth pointing out, as shown in Graph 2, that VL suffered a fluctuation in the number of annual cases in the Northeast region between the period from 2009 to 2019, with the year 2012 occupying the lowest value (1500 cases) and the year of 2014, obtaining the highest rate with approximately 2500 cases during the year, but no direct correlation was observed in the literature between these values and specific causes, only general values such as underreporting and neglect as general factors of disease incidence. Therefore, it is difficult to carry out reliable epidemiological surveys, since many fields of these studies remain open (REBOUÇAS, 2011; PIMENTEL, 2012).

Nevertheless, it is worth mentioning that there are 95.9 million self-declared brown people in the Brazilian population, which is the predominant race in the country's current situation. This fact justifies the higher percentage of VL cases in the brown race, followed by the white race, which is the second most populous in Brazil (graph 3). However, concerning the yellow race population (Asian descendants), the low rates of leishmaniasis coincide with the smallest amount of this range within the numbers of the Brazilian population, ranking last in the percentage of the analyzed races, while the race black occupies the 3rd place (7.44%) and the indigenous people the 4th (0.9%) in the ranking of percentages of race and ethnicity in the analyzed population in the northeast, which does not close any specific comparison with causes, but epidemiologically classifies the affected races in this population (AGÊNCIA BRASIL, 2017).

It should also be noted that in the Brazilian Northeast, unhealthy conditions, associated with the region's low per capita income, increase the potential for malnutrition among children, which justifies the fact that VL contaminates the 0-14-year-old population more frequently (graph 4) since the disease has a direct relationship with the immune response, which in states of malnutrition is incompetent (JORNAL DE PEDIATRIA, 2001). The 15-39 age group also has a high prevalence due to the greater emission of carbon dioxide emitted by the adult age group, a fact that is essential to understand the predilection of the mosquito - which is attracted to the gas in question (TORRES-Estrada, 2003).

According to the distribution of age groups of cases of visceral leishmaniasis in the Northeast from 2009 to 2019 (graph 5), in the first place (49%) corresponds to the range from 0 to 14 years, in second (28.4%) to 15 to 39 years, in third (16.2%) from 40 to 59 years and fourth place (6.2%) greater than 60 years. These data corroborate the findings of Elkhoury et al. 2008 and Cunha et al. 2020, whose epidemiological profiles of VL in the studies also showed higher percentages in the range of 40 to 59 years.

Regarding education, it is understood that the lack of understanding about the etiology and prophylaxis of the disease prevents full adherence to treatment, as well as a significant reduction in cases. In this sense, of the 40.14% of cases that were reported, incomplete primary education leads the percentage of people affected by VL (20.78%), followed by patients with incomplete secondary education (11.13%) and patients with incomplete higher education (4.15%). The findings in this study, concerning the education profile, allow for assessing the importance of health promotion that involves a set of strategies based on the union of the State, the population, and the Unified Health System.

5 CONCLUSION

Because of the results found in this study, it is concluded that Visceral Leishmaniasis and its persistent infection rate may be related to disorderly Brazilian urbanization, high rate of underreporting, and late diagnosis of the disease. In addition, with epidemiology, it is possible to state that this disease does not have a prevalence between races or gender. On the other hand, data indicate that there is a relationship between age and unfavorable socioeconomic status.

In short, the relevance of a broader look at Visceral Leishmaniasis is confirmed, since this pathology remains in non-compliance with the Brazilian public health framework, which generates high morbidity and mortality and high costs to the economy.

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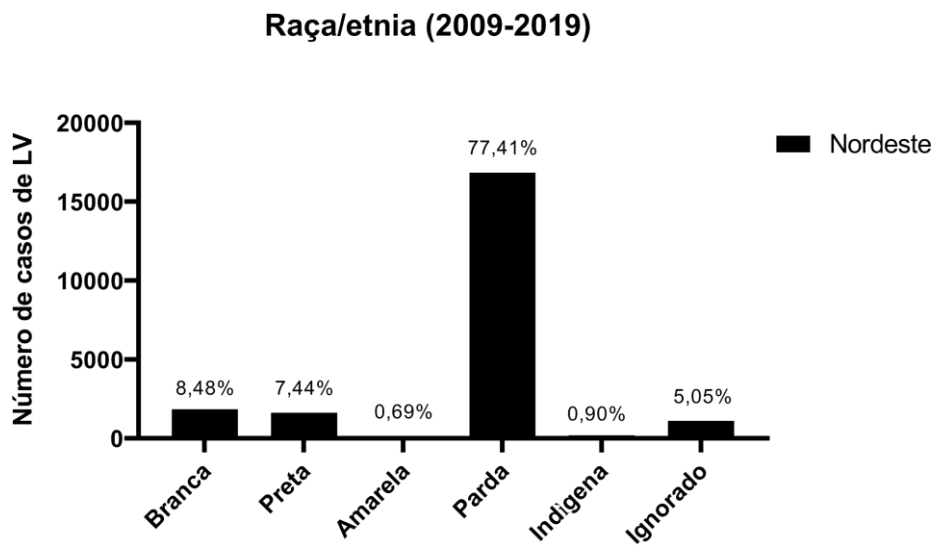
APPENDICES FIGURES AND TABLES

Graph 1: Notified cases of Visceral Leishmaniasis (VL) in the 4 most prevalent states in the Northeast region. Source: Cases notified in SINAN 2009-2019.
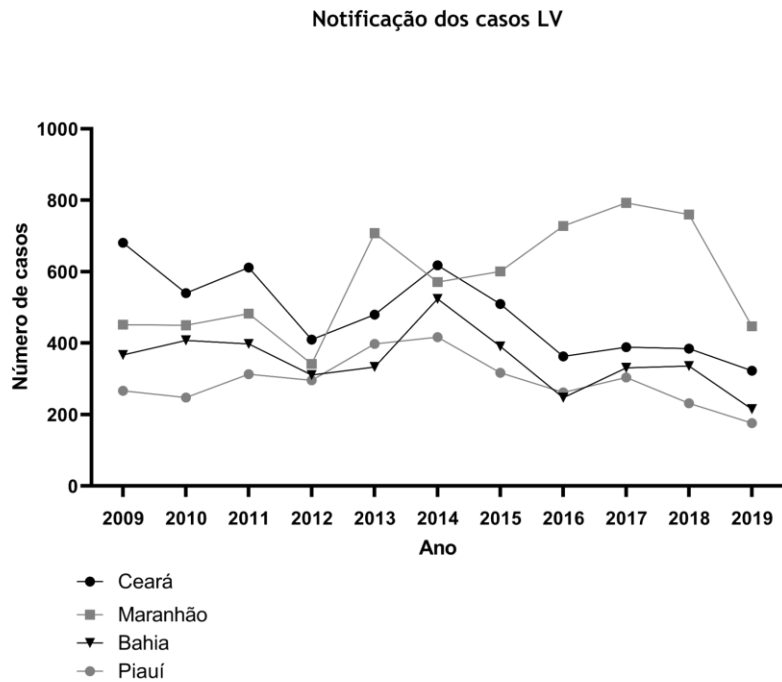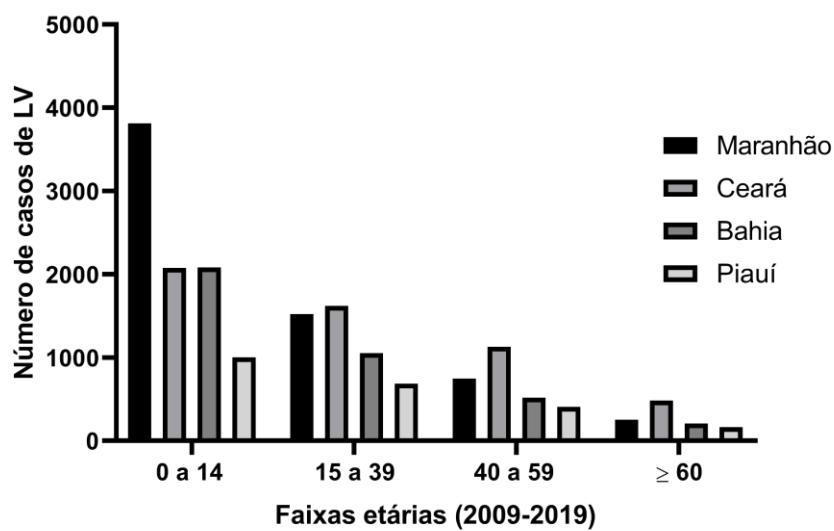

Graph 2: Cases of notification of Visceral Leishmaniasis (VL) in the Northeast region per year. Source: Cases notified in SINAN 2009-2019.
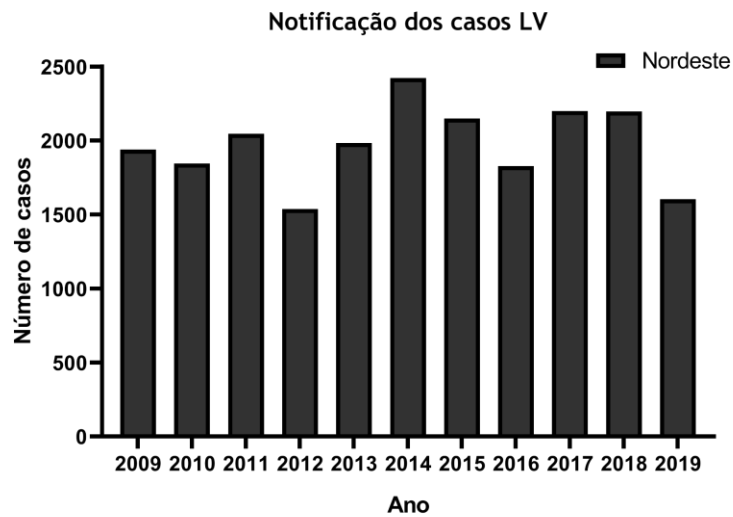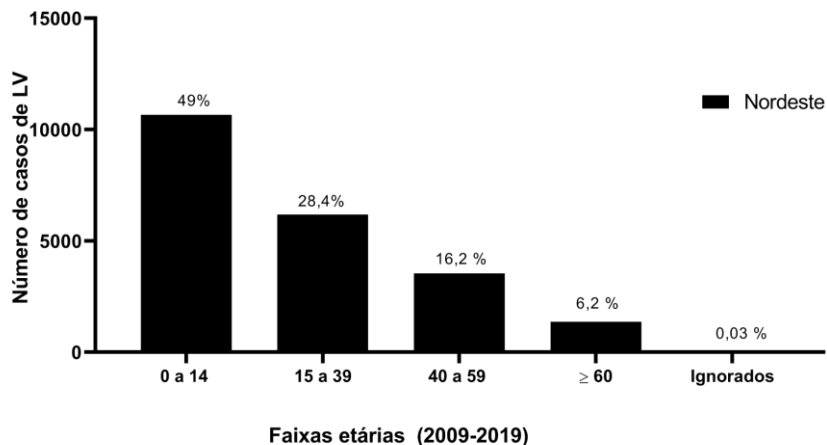
Graph 3: Race/ethnicity distribution of VL cases in the Northeast by year. Source: Cases notified in SINAN 2009-2019.

Raça/etnia (2009-2019)

Graph 4: Distribution of Visceral Leishmaniasis (VL) age groups in the 4 most prevalent states in the northeast region. Source: Cases notified in SINAN 2009-2019.

Graph 5: Distribution of Visceral Leishmaniasis (VL) age groups in the northeast region. Source: Cases notified in SINAN 2009-2019.

Graph 6: Distribution of education of patients with Visceral Leishmaniasis (VL) in the northeast region. Source: Cases notified in SINAN 2009-2019.
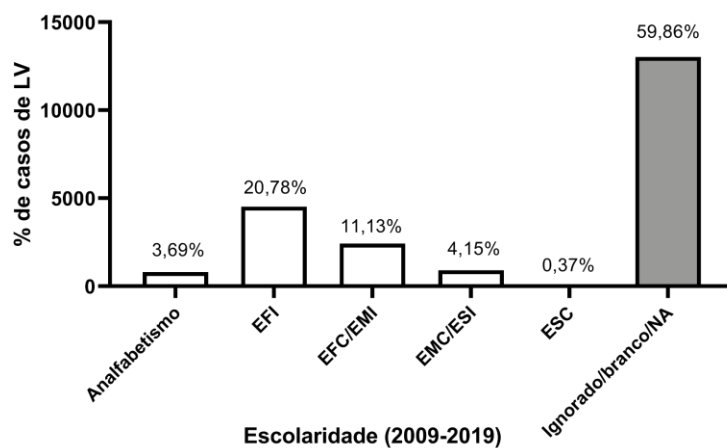
Legenda
EFI: ensino fundamental incompleto
EFC: ensino fundamental completo
EMI: ensino médio incompleto
EMC: ensino médio completo
ESI: ensino superior incompleto
ESC: ensino superior completo
NA: não se aplica

Graph 7: Evolution of VL cases in the Northeast from 2009 to 2019. Source: Cases notified in SINAN 2009-2019.

Evolução da Leishmaniose Visceral no Nordeste