



The importance of socio-environmental factors in the occurrence of visceral leishmaniasis in Maranhão and its clinical-epidemiological implications

A importância de fatores socioambientais na ocorrência de leishmaniose visceral no Maranhão e suas implicações clínico-epidemiológicas

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ABSTRACT

Visceral leishmaniasis, known as kala-azar, is an important global public health issue, especially in developing countries such as Brazil. Transmission is influenced by precarious socio-environmental conditions, with Maranhão standing out as an area of concern due to the high prevalence and lethality of untreated cases. The etiological agent is the protozoan *Leishmania*, transmitted by the straw mosquito and affecting both wild and domestic hosts, such as dogs. The study analyzes the relationship between socio-environmental factors and the occurrence of the disease, highlighting the need for prevention strategies to reduce its prevalence and incidence, focusing on health education and changes in habits.

Keywords: Leishmaniasis, Visceral leishmaniasis, Kala-azar.

INTRODUCTION

Visceral leishmaniasis (VL), an anthroponosis popularly known as kala-azar, is an important public health problem not only in Brazil, but also in other countries of the world, especially in developing countries, where precarious housing conditions, lack of basic sanitation,

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malnutrition, among other factors of socio-environmental vulnerability, have shown to have a great influence on the maintenance of negative epidemiological indices of this disease (AGUIAR; RODRIGUES, 2017; FERREIRA et al., 2024).

Epidemiological data estimate that there are 700,000 to 1,000,000 new cases of VL worldwide annually. In Brazil, as in 99 other countries, VL is endemic. In Maranhão, the epidemiological situation of the disease is worrisome, having a great influence on the conditions of social, economic and environmental vulnerability of the state, reflected in increasingly large rates of new cases, in addition to the high lethality of untreated cases. It is noteworthy that, in the case of untreated cases of VL, the mortality rate can reach 99%, further evidencing the severity of the disease (WHO, 2022; SENA et al., 2020).

The etiological agent of visceral leishmaniasis is the protozoan of the genus *Leishmania*, belonging to the order Kinetoplastida, of the family Trypanosomatidae, and *Leishmania chagasi* is the agent responsible for the clinical form of the disease in Brazil. The vectorial transmission of the protozoan occurs through the sandfly *Lutzomyia longipalpis*, popularly known as the straw mosquito. The protozoan finds in the Brazilian fauna some wild hosts such as foxes and marsupials, and the dog also has as a domestic host of the disease (GONTIJO; MELO, 2004; ABRANTES et al., 2018).

The clinical course of VL is usually prolonged, but acute cases may also occur. In most cases, the clinical presentation is due to the classic triad of intermittent fever, alteration of the general condition, and splenomegaly. The most severe cases are evidenced by signs and symptoms such as jaundice, hemorrhagic phenomena, generalized edema, toxemia, and hemodynamic instability (AGUIAR; RODRIGUES, 2017).

The present study demonstrates the impact of visceral leishmaniasis on public health worldwide, as well as in Brazil and Maranhão, addressing the importance of socio-environmental factors for the maintenance of the disease transmission chain and the high epidemiological indexes, especially in the state of Maranhão.

The main objective of this study is to analyze the importance of socio-environmental factors in the occurrence of visceral leishmaniasis in Maranhão and the clinical and epidemiological implications of the disease.



MATERIALS AND METHODS

This study is a bibliographic research with a descriptive and exploratory approach. The purpose of this study was to investigate the relevance of socio-environmental factors in the clinical and epidemiological picture of VL in the state of Maranhão, Brazil. The approach to the research is qualitative; It was based on bibliographic research and analysis of secondary data, so that the method used allows an in-depth and detailed knowledge about the socio-environmental determinants associated with the increase in lethality. To obtain the contributions in question, we selected scientific articles available in digital databases, which we accessed through platforms such as SciELO, PubMed and Google Scholar. We used the descriptors "leishmaniasis", "visceral leishmaniasis" and "kala-azar", associating them with the boolean operator AND to improve search results. We only included materials published in the last ten years, that is, between 2014 and 2024, that explored the epidemiological, clinical, and socio-environmental aspects of visceral leishmaniasis, with a focus on the Maranhão region. We discarded articles that were not available in full or that did not have direct links to the requested elements. The collected data were analyzed qualitatively, seeking to identify patterns, trends and gaps in the literature on the socio-environmental factors that influence the occurrence of visceral leishmaniasis in Maranhão. The analysis was aimed at correlating the data obtained with the socioeconomic, environmental and public health conditions of the region.

RESULTS

According to the survey carried out in the study, it was observed that Brazil, East Africa and India are the countries most affected by Visceral Leishmaniasis (WHO, 2023). From this, it can be seen that, in the Brazilian scenario, the state of Maranhão stands out as a major holder of cases of the disease in the country. According to a study conducted by Sena *et al.* (2020), a total of 3085 cases of VL were found in the state from 2012 to 2017.

Analyzing the panorama of the state of Maranhão, VL cases are distributed in the following municipalities: São Luís (48.03%); Empress (15.75%); President Dutra (13.03%); Coroatá (8.71%); Caxias (7.74%) (Sena *et al.*, 2020). Thus, it is possible to trace the socioepidemiological profile of those affected by VL: male (74.36%), self-declared brown (73.08%), aged 20 to 29 and 40 to 49 years (35.90%), with incomplete primary education (37.18%), living in urban areas (44.87%) (LAGES *et al.*, 2023).



In this sense, it is concluded that the clinical-epidemiological aspects of Visceral Leishmaniasis are directly affected by socio-environmental issues, which corroborates the clinical and epidemiological problems associated with this pathology. Thus, there is a need to develop prevention strategies for visceral leishmaniasis in order to reduce the prevalence and incidence of cases that cause the social and epidemiological problems characteristic of the pathology, demanding prophylaxis focused on health education and changes in citizens' habits.

FINAL THOUGHTS

In summary, the analysis of the socio-environmental factors of visceral leishmaniasis in Maranhão shows the need for integrated approaches. Thus, the link between poor living conditions, environmental degradation, and disease requires interventions that improve both vector control and social and environmental conditions. Therefore, multidisciplinary approaches, epidemiological surveillance, and public education are essential to reduce the impact of the disease.



REFERENCES

- Abrantes, T. R., et al. (2018). Fatores ambientais associados à ocorrência de leishmaniose visceral canina em uma área de recente introdução da doença no Estado do Rio de Janeiro, Brasil. *Caderno de Saúde Pública*, 34(1), 1-12. <https://doi.org/10.1590/0102-311X00021117>
- Aguiar, F. P., & Rodrigues, K. R. (2020). Leishmaniose visceral no Brasil: Artigo de revisão. *Revista Unimontes Científica*, 19(1), 192–204. <https://www.periodicos.unimontes.br/index.php/unicientifica/article/view/2119>
- Ferreira, J. R. S., et al. (2024). Spatio-temporal analysis of the visceral leishmaniasis in the state of Alagoas, Brazil. *Brazilian Journal of Biology*, 84, e253098. <https://doi.org/10.1590/1519-6984.253098>
- Gontijo, C. M. F., & Melo, M. N. (2004). Leishmaniose visceral no Brasil: Quadro atual, desafios e perspectivas. *Revista Brasileira de Epidemiologia*, 7(3), 338-349. <https://doi.org/10.1590/S1415-790X2004000300011>
- Lages, L. S., et al. (2023). Epidemiological survey of human and canine visceral leishmaniasis cases in the municipality of São Luís in the period from 2019 to 2020. *Concilium*, 23(3), 820–834. <https://www.clium.org/index.php/edicoes/article/view/873>
- Sena, L. A. C., et al. (2020). Avaliação epidemiológica da leishmaniose visceral no município de Imperatriz - MA entre os anos de 2012 e 2017. *Revista Eletrônica Acervo Saúde*, (49), e763. <https://doi.org/10.25248/reas.e763.2020>
- World Health Organization - WHO. (2022). Leishmaniasis. Geneva. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/leishmaniasis>