

SPACE-TEMPORAL EVOLUTION OF HUMAN AND CANINE VISCERAL LEISHMANIASIS IN ALAGOAS STATE: 2008 TO 2019

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Abstract: Aiming to demonstrate the spatio-temporal evolution of Visceral Leishmaniasis (VL) in the State of Alagoas, an ecological study of a historical series of new cases of Human Visceral Leishmaniasis (VL) was carried out in the Information System of Notifiable Diseases (SINAN) of the Ministry of Health according to the municipality of residence in the state of Alagoas-BR, period 2008 to 2019. Data were presented in tri-annual thematic maps of the geographic distribution of HVL. In the period (2008-2019) 509 new cases were reported, residing in 69 municipalities in the state. Of these, Palmeira dos Índios had the highest number of cases (54 cases - 10.6%), followed by São José da Tapera (36 cases - 7.1%). The spatio-temporal evolution shows the endemicity of the disease in the Sertão and Agreste region of the state. The analysis of serological data for Canine Visceral Leishmaniasis (CVL) and cases of HVL for the year 2019, shows the presence in almost all municipalities in these regions. The expansion and consolidation of VL in the municipalities evidences the necessary adoption of more effective measures to prevent and control the disease. In addition to the search for effective tools for the elimination and treatment of the disease aimed at protecting the individual and the community, the commitment of the whole society is necessary to prevent this zoonosis from definitively perpetuating as a sanitary disease in the entire state of Alagoas.

Keywords: Leishmania. Epidemiological surveillance. zoonoses.

INTRODUCTION

Visceral Leishmaniasis (VL), a chronic infectious disease of worldwide distribution, has records of 400,000 cases/year in 18 countries, where Brazil, Ethiopia, India, Sudan and Bangladesh account for 90% of cases (PAHO, 2018).

The etiologic agent, *Leishmania* (*Leishmania*) *infantum* chagasi. Its main vector in the Americas is the protozoan *Leishmania* (*Leishmania*) *infantum* chagasi (syn. *L. chagasi*) being transmitted by the bite of several species of sandflies of the genus *Lutzomyia* (BRASIL, 2019), which has dissemination of clear non-random patterns with increases in the number of cases and vectorial spread in the peridomicile, infection of domestic animals in peripheral areas and adjacent to residual forests (NUNES et al., 2018).

Vector density is related to hot, humid places and high valleys of organic matter, inhabiting forests, caves and cavities between rocks, which can invade homes and annexes (TRAVI; DANTAS-TORRES; MIRO, 2018). The transmission and consequent contamination occurs by the bite of the female, usually at dusk or at night (TEIXEIRA-NETO et al., 2014).

It has dynamics of dissemination of clear, non-random patterns and characterized by the increase in the number of cases and increasing dissemination of sandflies in peridomiciliary spaces and contamination of domestic animals in peripheral areas and adjacent to residual forests (NUNES et al., 2018).

It presents wild and domestic cycles, in this, the dog is its main reservoir and when seropositive is a risk factor for man. Preventive measures aim to reduce human-vector contact by active search, identification and treatment for humans, elimination of transmission foci beyond animal control (SILVA et al., 2018).

Present in small, medium and large cities, it has a spatial and epidemiological distribution impacted by environmental, climatic and socioeconomic factors, the disease has spread and has become more common in urban and periurban areas,

including Alagoas, thus becoming endemic. in several municipalities (TEIXEIRA, 2019).

Thus, the work aimed to demonstrate the spatio-temporal evolution of LVH and LVC in the State of Alagoas, from 2008 to 2019.

MATERIALS AND METHODS

An ecological study of a historical series of new cases of Human Visceral Leishmaniasis (VHL) was carried out according to the municipality of residence in Alagoas, covering the period from 2008 to 2019.

The state has a territorial extension of 27,843,295 km², an estimated average population for 2020 of 3,351,543 inhabitants and a population density and Human Development Index (HDI) of 0.631, occupying the 27th position among Brazilian states (IBGE, 2020). It consists of 122 municipalities which are distributed in three geographic mesoregions: Sertão, Agreste and East Alagoas, which are divided into microregions.

Data referring to cases of HVL reported in the period from 2008 to 2019 were collected in the Notifiable Diseases Information System (SINAN) (BRASIL, 2019).

In this study, the variables were analyzed and stratified by years, municipality and area of residence, and from the gross value of the total number of reported cases, tri-annual thematic maps of the geographical distribution of HVL covering the entire study period as well as data from 2019 regarding Canine Visceral Leishmaniasis (LVC).

The Microsoft Office Excel® program was used to tabulate the data, and the construction of tables and/or graphs and maps was performed in the interactive tabulator to tabulate data on the Internet TABWIN.

RESULTS AND DISCUSSION

In the period (2008-2019), 509 new cases of human visceral leishmaniasis were

reported in the state of Alagoas, residing in 69 municipalities in the state (Figure 1).

In the analysis stratified by municipality, Palmeira dos Índios, a municipality located in the rural region of the state, had the highest number of cases in the period (54 cases - 10.6%), and had no cases in just one year (2011).

The second municipality with the highest number of cases was São José da Tapera (36 cases - 7.1%), located in the hinterland region, which also had no reported case in 2013.

Analyzing the spatial distribution by municipality of infection and triennium, it appears that the first triennium (2008-2010) had 98 cases, with 2010 being the year with the highest frequency (40 cases). In 95% (93 cases) the infection occurred in 35 municipalities of Alagoas and 5 cases were imported from other states. São José da Tapera was the municipality of infection with the highest frequency of cases (18).

In the second triennium (2011-2013) there was an increase in municipalities with cases (36), however a decrease (-6%) in the absolute frequency of cases (92), three cases were imported and in seven the municipality of infection is ignored. Palmeira dos Índios was the municipality with the highest absolute frequency of cases (5). It was the year 2012 that presented the highest number of cases (38).

In the analysis of the third triennium (2014-2016), the number of municipalities of infection is the same as in the first triennium (35), but there is an increase (19.6%) in the frequency of cases (110).

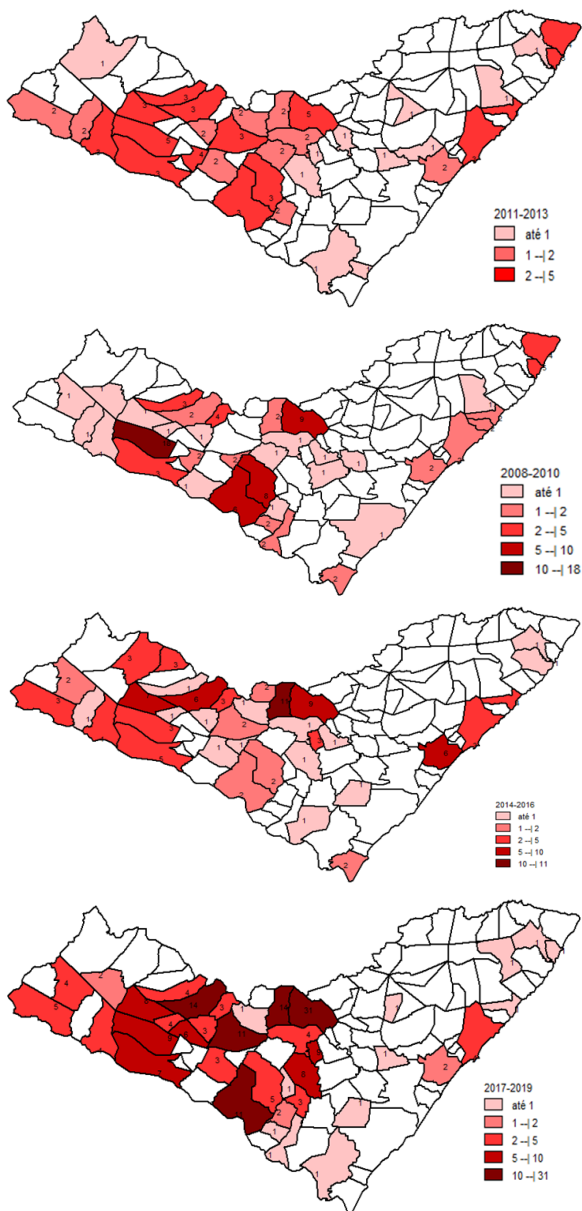


Figure 1. Temporal analysis of human cases of Visceral Leishmaniasis in Alagoas, in the period 2008-2019.

Source: Ministry of Health /SVS - Sinan Net

In the third triennium of reported cases, only one is allochthonous, and it was observed that there was an increase in the number of cases without information on the municipality of infection (10). The highest frequency of cases in this period occurred in Estrela de Alagoas, a municipality in the Alagoas agreste region, which borders

Palmeira dos Índios and the year with the highest detection was 2014 (45 cases).

In the last three years (2017-2019) there is an increase in the number of municipalities of infection (38) as well as a high increase (90%) in the absolute frequency of cases (209), of these 97 cases had 2019 as the year of onset of symptoms. 31 cases were infected in the municipality of Palmeira dos Índios, two were imported from other states, and in 15 the municipality of infection was ignored.

The analysis of data for the year 2019 regarding the serological results confirmed by the Enzymaimmunoassay (Elisa) methodology for Canine Visceral Leishmaniasis (LVC) developed in 50 municipalities in Alagoas shows 1,967 positive dogs, with an average of 39, median of 16, with minimum values of 1 and a maximum of 404, with an amplitude of variation of 403. The municipality with the highest number of cases of CVL was Santana do Ipanema.

The analysis of the correlation between CVL serological results and new cases reported in 2019 (Figure 2) demonstrates the direct correlation between infected dogs and human cases.

The presence of LVC is observed in practically all the municipalities of Sertão and Agreste, demonstrating the need to intensify surveillance actions, with emphasis on the intensification of the detection and treatment of human cases, control of domestic reservoirs and combating the vector (WHO, 2018).

The persistence of areas of occurrence and emergence of new foci demonstrates that current control measures are being insufficient to control the disease in endemic areas (VON ZUBEN; DONALÍSIO, 2016).

In the period studied, 140 (26.4%) lived in urban areas and 40 (7.5%) in peri-urban areas. Highlight for the municipality of Palmeira dos Índios where of the 54 notifications, only 19 (35.1%) were residents of the rural area.

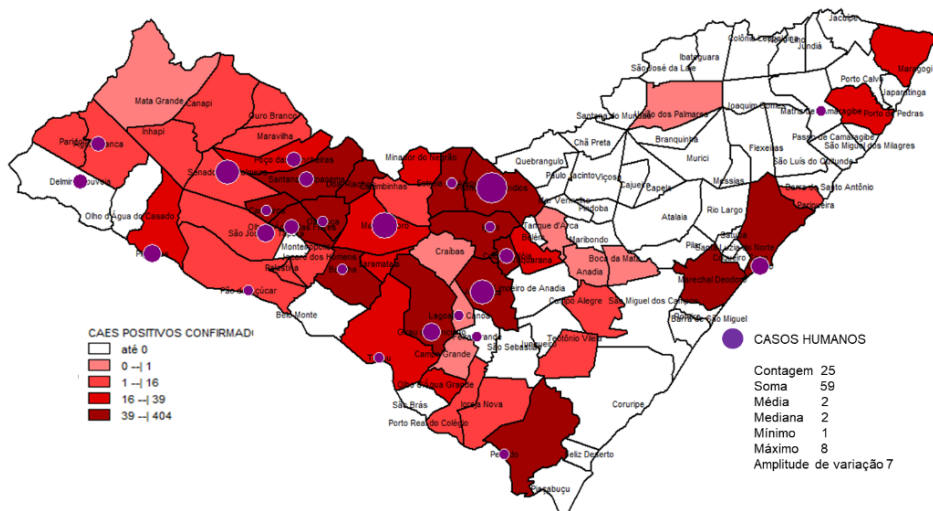


Figure 2. Mapping of canine visceral leishmaniasis cases in the municipalities of Alagoas, confirmed by elisa and human cases – AL 2019.

Source: Ministry of Health/SVS – Sinan Net/State Health Department – AL.

These data reflect the domiciliation capacity of the vector, which can currently be found in practically a large part of the Alagoas territory, having in some municipalities overcome the paradigm of rural disease and found itself established in urban and peri-urban areas (ROCHA et al., 2015).

Areas have in common a strong human action on the environment, environmental and climatic factors determine their spatial distribution, areas of urbanization, deforestation, soil degradation and temperature variations impact the disease cycle, providing its expansion to non-endemic areas (SEVÁ et al. al., 2016). The presence in small and medium-sized cities is also the result of having complex epidemiology that is difficult to control, influenced by socioeconomic factors such as poverty, lack of basic sanitation, waste collection, precariousness of housing, nutritional status and availability of health services and actions. characteristics to varying degrees in these locations (VON ZUBEN and DONALÍSIO, 2016; TEIXEIRA, 2019).

In addition to population movements that both allow the introduction of the agent in free areas and the insertion of susceptibles in endemic areas, human pressure on the environment, disorderly occupation of physical space, precarious living conditions of rural and urban populations are factors determinants of the health-disease process to be considered by the endemicity of the disease (Brasil, 2017).

CONCLUSIONS

The expansion and consolidation of VL in the municipalities evidences the need to adopt more effective measures to prevent and control the disease. In addition to the search for effective tools to eliminate the disease, encouraging studies aimed at protecting the individual and the community, a commitment from the whole society is necessary to prevent this zoonosis from being definitively established as a sanitary disease in the entire state of Alagoas.

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