

BRIEF COMMUNICATION

GEOGRAPHICAL EXPANSION OF CANINE VISCERAL LEISHMANIASIS IN RIO DE JANEIRO STATE, BRAZIL

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SUMMARY

Visceral Leishmaniasis (VL) is a vector-borne disease that affects humans, and domestic and wild animals. It is caused by the protozoan *Leishmania (Leishmania) infantum* (syn = *Leishmania chagasi*). The domestic dog (*Canis familiaris*) is considered the main reservoir of the etiologic agent of VL in domestic and peridomestic environments. In the past three years, although control actions involving domestic dogs are routinely performed in endemic areas of the Rio de Janeiro State, new cases of canine visceral leishmaniasis (CVL) have been reported in several municipalities. The objective of this short communication was to describe the geographical expansion of CVL in the Rio de Janeiro State, Brazil, through its reports in the scientific literature and studies performed by our group. From 2010 to 2013, autochthonous and allochthonous cases of CVL were reported in the municipalities of Mangaratiba, Marica, Niterói, Barra Mansa, Cachoeiras de Macacu, Volta Redonda, Resende and Rio de Janeiro. These reports demonstrate that CVL is in intense geographical expansion around the state; therefore, a joint effort by public agencies, veterinarians and researchers is needed in order to minimize and/or even prevent the dispersion of this disease.

KEYWORDS: Canine visceral leishmaniasis; Geographical expansion; Rio de Janeiro.

Visceral Leishmaniasis (VL) is a disease that affects humans, and domestic and wild animals. It is caused by the protozoan *Leishmania (Leishmania) infantum* (syn = *Leishmania chagasi*). In Brazil, the main vector responsible for its transmission is the female phlebotomine sand fly *Lutzomyia longipalpis*¹³, but *Lutzomyia cruzi* has also been regarded as its vector in the Mato Grosso do Sul State²⁶.

The domestic dog (*Canis familiaris*) is considered the main reservoir of the etiologic agent of VL¹⁰ because of its high susceptibility to infection and greater proximity to humans, in addition to its high skin parasitism, which contributes to the maintenance and expansion of the transmission cycle in domestic and peridomestic environments^{1,3}.

In Brazil, VL is an endemic zoonosis currently present in 21 of 27 states of the country, with higher concentration in the northeastern region^{24,31}.

The National Program for VL Control³ adopts the euthanasia of serum reactive canine in its control strategies. However, some authors argue that euthanasia of seropositive dogs is not an effective measure to control VL^{6,21}.

Formerly, the use of the enzyme-linked immunosorbent assay (ELISA) was recommended for the screening of CVL and indirect immunofluorescence assay (IFA) was used as a confirmatory test for its diagnosis³. As of 2011, after conducting a multicenter study for the assessment of serological tests, rapid chromatographic immunoassay based on dual-path platform (DPP) was introduced for disease screening and ELISA was used as confirmatory test²². Positive results of serological tests are used as a criterion for indication of euthanasia in dogs.

Significant changes in the transmission pattern of VL have been verified lately; while it was initially found mostly in rural and wild environments, nowadays it is predominant in urban centers^{3,11,30}. This process of urbanization has taken place gradually over the past thirty years, since the first large urban epidemics were recorded in Teresina, Piauí State⁷ and São Luiz, Maranhão State²⁷. Later, outbreaks of the disease were described in Rio de Janeiro, Rio de Janeiro State¹⁶ and Belo Horizonte, Minas Gerais State¹⁴, as well as in Três Lagoas and Campo Grande, Mato Grosso do Sul State¹⁹ and Palmas, Tocantins State³.

Historically, canine cases of VL often precede spatial and temporal

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human cases, as it has occurred in the Ceará State⁹ and in Belo Horizonte, Minas Gerais State². In the Rio Grande do Sul State, the first canine cases were registered in the municipality of São Borja in 2008 and the first human case occurred in 2009²⁴.

This short communication aims to describe the geographical expansion of CVL in Rio de Janeiro State, Brazil, through its reports in the scientific literature and studies performed by our group.

In Rio de Janeiro State, a human case of VL was reported for the first time in 1977, in a neighborhood of the west zone of the city of Rio de Janeiro, and since then, canine cases have been frequently reported in the same region¹⁵. The focus of VL reported in the municipality of Rio de Janeiro, in that year, involving human and canine infection, was the most southern focus in Brazil associated with the presence of *Lutzomyia longipalpis* and canine infection^{17,18}.

In 1980, the Brazilian Ministry of Health officially established the canine survey in areas with human cases of the disease, such as Realengo, Bangu and Serra do Lameirao - Senador Camara. In 1982-83, further investigations were carried out after reports of new human cases in Campo Grande and Jacarepagua, which are areas where cases of tegumentary leishmaniasis were also reported. Currently, canine studies take place mainly in neighborhoods located in the west zone of the city^{15,18}. Also, whenever there is a suspected or confirmed case in a new region, entomological and serological surveys are conducted so that action can be taken³.

Despite the control performed in endemic areas of the city of Rio de Janeiro, a worrisome persistence of VL-seropositive dogs has been observed¹⁵. In 2010, a case of CVL was described in the south zone of the city¹¹. CAMPOS *et al.*⁴ reported the first case of CVL in the municipality of Volta Redonda and predicted the expansion of this parasitosis in non-endemic areas, as it had already been verified in Maricá⁸.

In 2011 and 2012, new cases of CVL were reported in the municipalities of Mangaratiba, Maricá, Niterói, Volta Redonda and Rio de Janeiro²². The neighborhood of Caju, located in the port area, was classified as the first urban focus with active transmission of CVL in the city of Rio de Janeiro, after confirmation of 25 cases²³. After the identification of canine cases, three human cases were reported: two autochthonous cases, one in Volta Redonda²⁵ and another (fatal) in Barra Mansa, in addition to a third case of indeterminate autochthony in the city of Rio de Janeiro²².

The hypothesis that canine cases of VL precede human cases, concomitantly with the presence of the vector *L. longipalpis*, suitable environments, and the geographical expansion of canine cases in Rio de Janeiro State, has put epidemiological surveillance authorities on alert.

Unlike what happens in endemic regions, the introduction of CVL in municipalities considered unaffected may result in sudden expansion of the disease due to lack of knowledge on the following: actual dispersion of the disease, dynamic of transmission in these areas, sandfly fauna, wild reservoirs, and canine population exposed to the parasite for the first time¹².

Factors such as environmental degradation, migration flows and

unplanned urban occupation associated with precarious sanitation and housing, are also elements that favor the adaptation of vectors to anthropogenically modified environments²⁰. With the expansion of motorway networks and popularization of travel, the transit of people and their pets have increased, thus increasing the risk of dispersion of certain zoonoses, including VL⁵. In this context, some owners move their animals to non-endemic areas in order to avoid their euthanasia, endangering not only the human population, but also the canine population¹².

In recent years, two cases of CVL originated in areas of intense transmission of VL were described in unaffected areas. The first case was reported by SILVA *et al.*²⁸ in Cachoeiras de Macacu, and originated in the municipality of Pedreiras, Maranhao State. The second case was described by VASCONCELOS *et al.*²⁹ in the municipality of Resende, and originated in the north mesoregion of Minas Gerais State. The transit of these animals may have contributed to the introduction of the disease in these regions, the etiological agent being found in those new places; a suitable environment and specific vectors.

The identification of allochthonous cases in unaffected areas does not mean that human cases might occur; nevertheless, the occurrence of an event of CVL is an alert to conduct surveillance activities in order to prevent the dispersion of the disease and prepare health services and the local population to cope with the problem.

It is believed that this geographical expansion of CVL, not only in the Rio de Janeiro State, but also in other Brazilian states, can be attributed to numerous factors, such as difficulties in eliminating the reservoirs; epidemiological diversity of affected regions; high financial and social costs of control; adaptive capacity; and insufficient measures adopted for vector control as well as for the control of other suspected vectors involved in the cycle.

This short communication demonstrates the need for a joint effort by the public agencies responsible for the control of visceral leishmaniasis, researchers and private veterinarians with the aim of deploying a set of actions, besides those already performed and described by the control program, to minimize and/or even prevent the dispersion of this disease.

RESUMO

Expansão geográfica da leishmaniose visceral canina no estado do Rio de Janeiro, Brasil

A Leishmaniose Visceral (LV) é uma doença de transmissão vetorial que acomete seres humanos, animais domésticos e silvestres causada pelo protozoário *Leishmania (Leishmania) infantum* (syn = *Leishmania chagasi*). O cão doméstico (*Canis familiaris*) é considerado principal reservatório do agente etiológico da LV no ambiente domiciliar e peridomiciliar. Nos últimos anos, apesar de ações de controle envolvendo o cão doméstico serem rotineiramente realizados em áreas endêmicas do município do Rio de Janeiro, tem sido verificado novos casos de leishmaniose visceral canina (LVC) em diversos municípios do estado. O objetivo dessa comunicação curta foi descrever a expansão geográfica da LVC no estado do Rio de Janeiro, Brasil, através de relatos na literatura científica e estudos realizados pelo nosso grupo de pesquisa. No período de 2010 a 2013 casos de LVC autóctones e alóctones foram notificados nos municípios de Mangaratiba, Maricá, Niterói, Barra

Mansa, Cachoeiras de Macacu, Volta Redonda, Resende e Rio de Janeiro. Esses relatos demonstram que a LVC está em franca expansão geográfica no estado, sendo necessária ação conjunta dos órgãos públicos, médicos veterinários e pesquisadores no intuito de minimizar e/ou até mesmo evitar a expansão da doença.

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