Study tracks leishmaniasis in dogs, wild animals and sand flies in Brazil

July 13 2017

A condominium in Campinas, Brazil, where animals were detected with *Leishmania* infantum infection. Credit: Laís Moraes Paiz, 2015.

In the past, leishmaniasis—a parasitic infection that can be fatal in humans—has been confined to rural areas of the developing world. More recently, however, epidemics have occurred in urban environments, particularly areas of recent development. Now, researchers have surveyed the environmentally protected area in Campinas, Southeastern

Brazil, which has undergone several changes by human action, especially the implementation of condominiums, and revealed that more than one percent of dogs, as well as some opossums and insect species in the area carry the parasite responsible for the most dangerous form of leishmaniasis. The results of their study are published in *PLOS Neglected Tropical Diseases*.

Leishmaniasis is caused by *Leishmania* parasites, which are spread by the bite of infected sand flies. There are three forms of the disease; visceral leishmaniasis (VL)—or kala-azar—is the most serious and is fatal in most cases if left untreated. Seven countries, including Brazil, are responsible for most of the VL cases in the world. Campinas, a city in Sao Paulo State in southeastern Brazil, reported the first case of VL in a dog in 2009 in a resident condominium located in the environmentally protected area.

In the new work, researchers of the State University of Campinas and Adolfo Lutz Institute, Brazil, and colleagues from the Municipal Health Department wanted to examine the incidence of VL in animals and insects in 18 different points distributed in the 223 square kilometer environmentally protected area (EPA) where the original case was reported. The researchers collected nearly 600 blood samples from domestic dogs in the development in both 2013 and 2015 and, for three nights a month during a year-long study period, set up 60 baited ground traps to catch small mammals throughout the area as well as 2 or 3 light traps to catch insects. Blood samples were taken of captured mammals and the researchers used serological tests to study the infection in dogs and genetic testing to study the wild animals and insect specimens.

In 2013, 1.5% of domestic dogs have antibodies for VL; in 2015, 1.3% tested positive. 477 sand flies were collected from the EPA, including six species of sand fly known or suspected to be able to transmit leishmaniasis. 3 individual flies carried *Leishmania* species responsible

for VL. Eighty-two wild mammals from six species were captured during the study, and two opossums were identified as carrying *Leishmania* in blood, the first reported occurrence of the parasite in wild mammals in the region.

"Discussion concerning the participation of wild species in the transmission of zoonotic parasites has become particularly important in recent years with the consolidation of the One Health concept. Anthropogenic changes in ecosystems are particularly important in this context, resulting in greater proximity between wild and domestic animals and humans," the researchers say. "Investigating a new VL focus in all its distinct aspects contributes to our understanding of the key elements of the transmission dynamics and disease control."

More information: Donalisio MR, Paiz LM, da Silva VG, Richini-Pereira VB, von Zuben APB, Castagna CL, et al. (2017) Visceral leishmaniasis in an environmentally protected area in southeastern Brazil: Epidemiological and laboratory cross-sectional investigation of phlebotomine fauna, wild hosts and canine cases. *PLoS Negl Trop Dis* 11(7): e0005666. doi.org/10.1371/journal.pntd.0005666

Provided by Public Library of Science