Letter to the Editor

Leishmaniasis in cats: more important than we believe?

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Leishmaniasis is one of the world, neglected tropical diseases (NTD), recently, celebrated its day (January 30, 2020). Infection due to *Leishmania* is a major public health problem in many tropical countries; due to its high incidence and wide geographical distribution [1]. Both domestic and wild animals may serve as host reservoirs of *Leishmania* spp [2]. The Role of dogs in the zoonotic cycle of *Leishmania* spp, especially in urban and peri-urban areas, has long been understood. Nevertheless, recent studies have detected *Leishmania* infections in domestic cats.

Worldwide, five species of *Leishmania* have been reported in cats, although most cases involve *Leishmania infantum* [3] the causative agent of human and canine visceral leishmaniasis.

The causative agent of leishmaniasis is transmitted from man to man by differente especies of sandfly, *Lutzomyia* in Latin America. Approximately, 600 species of sandflies are known but only 10% of these acts as disease vectors. Furthermore, only 30 species of these are important for public health [3]. *Lutzomyia shannoni* is a one of the vectors of *L. infantum*. This is known to bite dogs and other mammals and has been incriminated in the transmission of *L. brasiliensis* in South America.

Skin lesions (ulcerative, crusty, nodular or scaly dermatitis) are the most frequent clinical manifestations and sometimes the only findings on physical examination. Lymph node enlargement, weight loss, ocular involvement (nodular blepharitis, uveitis, panophthalmitis), decreased appetite, chronic gingivo-stomatitis and lethargy are the most frequent non-cutaneous findings, alone or in combination [4].

As already mentioned above, *L. Infantum* is one of the causes of leishamaniasis in felines. *L. infantum* is probably transmitted to cats by sandflies, as phlebotomus feed on cats and cats become infected after feeding on cats with natural infection.

Most of the existing information on feline infection with *L. infantum* comes from cases described in the Mediterranean Basin. According to different studies, the prevalence rate of the infection is usually lower than the prevalence of canine infection. Approximately 100 clinical cases have been reported in Europe in the last 25 years (Italy, Spain, France, Portugal, Greece, Iran, Israel, and Spain) with some reported cases (Switzerland) in cats imported from endemic regions. In America, Brazil and Mexico are the countries where reports of the disease have been found [5].

Humans and pets are accidental guests for many species of *Leishmania*, which is in cycles between animals Wild and sand flies. *Leishmania infantum*, *Leishmania peruviana* and possibly other species can stay in dogs; suffer the risk of transmission to people. Other pets may be involved as guests of secondary maintenance *Leishmania donovani* and *Leishmania tropica* are adapted to humans, although sometimes animals can also become infected [6].

In general, *Leishmania spp*. it is transmitted indirectly between hosts by means of sandflies of the genus *Phlebotomus* and *Lutzomyia*, which are biological

vectors. Each species of *Leishmania* is adapted to the transmission in certain species of sandflies. Only females feed on blood. The fly activity occurs when the weather is wet and there is no wind or rain. These insects they are generally more active at sunrise, sunset and during the night, but they bite if they are disturbed in their hiding places (animal burrows, holes in the trees, caverns, houses and other places relatively fresh and moist), during the day. They are attracted to the light and can enter the buildings at night. The Leishmania transovarian transmission seems not occur and in areas with cold temperatures, the parasite Survives in mammalian hosts. In zones where sandflies transmit *Leishmania spp*., it is likely that ticks and fleas are not important in the epidemiology of the disease. However, they could be involved in less cases frequent dog-dog transmission elsewhere.

Mammals can become infected without presenting symptoms for long periods of time, and with often remain chronically infected even after, they are cured clinically. The animals subclinically infected can transmit *Leishmania* to sand flies. These parasites they have also been transmitted by transfusions of blood in people and dogs, and by transmission transplacental in dogs, mice and humans. In the canine leishmaniasis, produced by *L. infantum*, the Parasites can be found in saliva, urine, semen, conjunctival secretions and also in the blood. It has been proven that venereal transmission occurs in dogs, and it is also possible that there are other ways of propagation. Unusual cases of horizontal transmission between dogs that live in a same home or canil. The background of the cases suggests that some of those animals may have infected during a fight. In a known case, a dog licked his partner's injuries or ingested blood during a hemorrhage. Epidemiological research in the US in foxhounds suggest that *L. infantum* has been transmitted directly from a dog to another, although the transmission has not been ruled out mediated by sand fly or transfer by other arthropods. Instead, it is believed that the sandflies transmit the disease to people, from wild mammals in southern central Texas. The risk of direct transmission of dogs is unknown [7].

The most common clinical manifestation in cats is the cutaneous leishmaniasis, which includes the appearance of ulcerative or crusty lesions in the nose and/or ears with higher frequency, although they may also appear on the lips and eyelids; sometimes it manifests also with alopecia; however, these symptoms they are nonspecific and can be confused with other common diseases in cats such as cryptococcosis or sporotrichosis, which recently are causing epidemics in Brazil. The *L. infantum* species, associated with manifestations visceral in humans and dogs, in cats frequently causes skin manifestations. On the other hand, visceral leishmaniasis is not common and when it occurs, it manifests with compromise of liver, spleen, kidneys and lymphadenopathy.

An attempt has also been made to establish a relationship between feline retrovirus infection such as immunodeficiency virus (FIV) and feline leukemia (FLEV) with susceptibility to infection and the development of symptoms (size and evolution of lesions, dissemination, among others), but so far no clear relationship has been found between these manifestations [8].

The diagnosis is made by immunological techniques, including:

- IFI (cut-off point: 1/80)
- ELISA (validated OD values)
- DAT (cut-off point: 1/800)
- Western Blot (detection of 18KDa band)

Also, by parasitological diagnosis, including:

- Cytological evaluation of any cutaneous, mucocutaneous or mucosal lesions, samples of lymph nodes and bone marrow.
- PCR of any skin lesion, mucocutaneous or mucous lesion, lymph node, bone marrow, blood, samples of connective or oral tissue.
- Cultivation of any skin lesion, mucocutaneous or mucous lesion, lymph node, bone marrow and blood sample.

A serological analysis should be performed in cats with clinical signs and/or clinical-pathological alterations compatible with feline leishmaniasis to confirm the diagnosis.

However, in cases of negative or positive-low antibody titers, a parasitological technique should be used to detect the infection (cytology, histology, PCR or culture) to confirm the diagnosis. The evaluation of the specific serology of Leishmania together with the PCR technique (blood, lymph node samples or connective tissue) is recommended in the following situations in endemic areas:

- Blood donors
- Cats that require immunosuppressive treatments.
- Before catching cats in non-endemic areas [5-8].

In conclusion, more studies are needed, in order to establish the real spectrum of feline leishmaniasis, especially in countries, such as Colombia, where there is a lack of studies on it. Recently, in Venezuela, cases of feline leishmaniasis have been reported [9].

Leishmaniasis continue to be a challenge in the tropics, including Colombia, as a persistent and neglected zoonotic disease [10], especially, although not restricted to rural areas, as have been demonstrated recently in Cali, Valle del Cauca, Colombia, with a confirmed case of visceral leishmaniasis in a dog [11].

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