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# Infectiousness to sand flies of a cat naturally infected with *Leishmania infantum* at diagnosis and after three different courses of treatment

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**Background**

Xenodiagnosis is the ideal technique for determining whether an infected host can naturally transfer the pathogen to a potential vector [1]. To date, reports, and descriptions of the treatment of cats with feline leishmaniosis (FeL) are minimal and none of the reported cases have evaluated the ability of a treated cat to infect the vector. The aim of this study was to evaluate three treatment protocols for FeL in a domestic cat and their impacts on the transmission of *Leishmania infantum* to the vector *Lutzomyia longipalpis*.

**Materials and Methods**

A domestic cat with eyelid and oral nodules, and abdominal distension was examined at a Veterinary Hospital in Sorocaba-São Paulo, Brazil, and *L. infantum* infection was detected by serological, molecular, and parasitological tests. Tests against retroviruses were negative. After that, the cat was submitted to xenodiagnosis (xenodiagnosis 1). For this purpose, the cat was anesthetized and thereafter placed in an individual nylon cage. The *Lu. longipalpis* female sandflies were released in the nylon cage and the cat was kept exposed for 60 minutes. The presence of *L. infantum* in the engorged females was detected by parasitological assays and the intensity of *Lu. longipalpis* infection was classified [2]. The cat was then treated with marbofloxacin (5 mg/kg, q24h, PO for 30 days) (therapy 1), but clinical signs persisted, and parasites were still present in lymph nodes and bone marrow smears. Consequently, miltefosine was administered at 2mg/kg, orally, once daily for 28 days (therapy 2). One month after completing miltefosine treatment, a second xenodiagnosis was performed (xenodiagnosis 2). After 30 days of xenodiagnosis 2, the cat was treated with allopurinol at 20 mg/kg, orally, daily for 120 days (therapy 3). A final xenodiagnosis (xenodiagnosis 3) was conducted on the last day of therapy 3.

**Results**

Promastigotes were observed in 21/52 females (40.38%) in xenodiagnosis 1. After treatment with marbofloxacin clinical signs persisted, and the cat remained positive in all tests. Therefore, he was treated with miltefosine for 28 days. One month after treatment with miltefosine the cat was still positive in all diagnosis tests and promastigotes were observed in 5/9 engorged females (55.55%) dissected at xenodiagnosis 2. Finally, after allopurinol treatment, a good clinical improvement was observed (Figure 1), but the cat remained positive. The concentration of total proteins and globulins in the biochemical analyses and the titration of the immunofluorescence antibody test (IFAT) were high before and after each therapy (Table 1). In a final xenodiagnosis (xenodiagnosis 3), *Leishmania* was observed in the midgut of 2/29 (6.89%) of engorged females (Table 2).

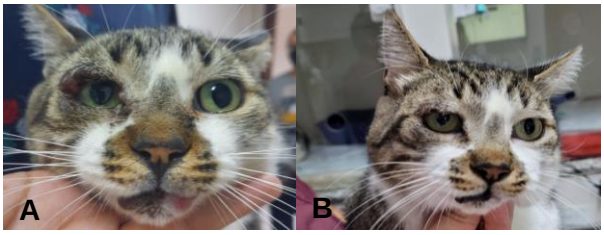


**Figure 1:** Cat infected with *L. infantum* before treatment (A) and after treatment with allopurinol (B).

**Table 1:** Concentration of total proteins, albumin and globulins in the blood, and serological, parasitological, and molecular diagnoses of the *L. infantum* infected cat before and after each therapy.

| Time | Total proteins (g/dL) | Albumin (mg/dL) | Globulins (mg/dL) | IFAT titration | Cytology | *Leishmania* spp. kDNA PCR |
|---|---|---|---|---|---|---|
| **Before treatments** | 8.1 | 2.8 | 5.3 | 10,240 | Positive | Positive |
| **Therapy 1** | 8.7 | 2.7 | 6.0 | 10,240 | Positive | Positive |
| **Therapy 2** | 9.0 | 2.8 | 6.2 | 5,120 | Positive | Positive |
| **Therapy 3** | 10.0 | 3.1 | 6.9 | 10,240 | Positive | Positive |

**Table 2:** Intensity of *Lu. longipalpis* sand flies infection in parasitological assays after xenodiagnosis.

| Infection intensity | (+) 1-50 promastigotes | (++) 51-100 promastigotes | (+++) 101-200 promastigotes | (++++) > 201 promastigotes |
|---|---|---|---|---|
| **Xenodiagnosis 1** | 13/21 (62%) | 2/21 (9,5%) | 0 | 6/21 (28,5%) |
| **Xenodiagnosis 2** | 2/5 (40%) | 2/5 (40%) | 1/5(20%) | 0 |
| **Xenodiagnosis 3** | 2/2 (100%) | 0 | 0 | 0 |

## Conclusion

Herein, only treatment with allopurinol was able to improve clinical signs in FeL, but transmission to the vector was not blocked.

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