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Letter to the editor

Nephrin gene expression in chronic kidney disease of dogs with *Leishmania (Leishmania) infantum chagasi*

Dear Editor,

Visceral leishmaniasis caused by *Leishmania* (*Leishmania*) *infantum chagasi* is the most severe form of the disease. In Brazil, this disease is transmitted through the bite of sand flies of the genus *Lutzomyia*.[1] The clinical signs of the disease in canines, which are similar to those in humans, depend on the individual's humoral and cellular response, and kidney disease is the main cause of death.[2] In visceral leishmaniasis nephropathies caused by glomerular diseases are a common cause of chronic renal failure.[2–4] Glomerular podocyte injury causes proteinuria and results in tubular and interstitial injury.[5] Thus, the aim of the study was to quantify nephrin gene expression in dogs suffering from chronic kidney disease (CKD) associated with visceral leishmaniasis.

Sixty-nine dogs with CKD were diagnosed based on their history, the presence of azotemia and isosthenuria, and were grouped according to classification proposed by the *International Renal Interest Society* (IRIS). Urine, blood and bone marrow samples were collected by jugular venipuncture, cystocentesis and/or urethral catheter, and sternal puncture, respectively.

This study was approved by and conducted according to the guidelines of the Ethics Committee on Animal Use of the Federal University of Mato Grosso (Protocol # 23108.043331/12-9). The DNA extracted from blood and bone marrow was subjected to PCR detection of *L.* (*L.*) *infantum chagasi*. Cell pellets were obtained by centrifuging 10 mL of urine for RNA extraction, followed by RT-qPCR to quantify nephrin gene expression. Supernatant from centrifuged urine was used for biochemical determination of proteinuria.

Nephrin was quantified in the urinary sediment of 47 dogs and *L.* (*L.*) *infantum chagasi* was detected in the bone marrow and/or blood of 11 dogs. The relative quantitation of nephrin was lower in dogs in advanced stages of renal disease than in the initial stages, and those positive for *L. L. infantum chagasi* showed no correlation with the presence of the parasite ($r = -0.35$).

The quantitation of nephrin expression according to the stage of CKD and its association with *L. L. infantum chagasi* have not been reported previously. Kidney disease is an important condition in the clinical assessment of small animals, in view of the high prevalence and severity of its subsequent clinical manifestations. Moreover, owing to the zoonotic potential of visceral leishmaniasis associated with the presence of asymptomaticity in dogs, the early detection of kidney disease enables the evolution of the disease to be monitored.

Visceral leishmaniasis impairs the immune system and interferes with the inflammatory response, resulting in several changes that culminate in death from renal failure. Knowing that canine cases precede the occurrence of the disease in humans, it is important to identify the changes that may occur in both species. Therefore, dogs also serve as a study model of this disease, assisting in the establishment of a more accurate prognosis for humans, and is a control measure that requires fast and accurate diagnostic tools. Hence, the quantitation of nephrin gene expression in urinary sediment is a practical and non-invasive tool for monitoring the development of kidney disease.

Conflicts of interest

The authors declare no conflicts of interest.

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Mariana de Medeiros Torres, Cristiane Silva Chitarra, Luciano Nakazato, Arleana Bom Parto Ferreira de Almeida, Valéria Régia Franco Sousa*

Universidade Federal de Mato Grosso (UFMT), Faculdade de Medicina Veterinária, Departmento de Medicina Veterinária Clínica, Cuiabá, MT, Brazil

* *Corresponding author.*
E-mail address: valeriaregia27@gmail.com (V.R. Sousa).

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