A vaccine therapy for canine visceral leishmaniasis promoted significant improvement of clinical and immune status and strong reduction in parasite burden suggesting the blockade infection to sand flies.

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1 Background

Visceral leishmaniasis (VL), caused by *L. infantum*, is the most fatal form of leishmaniasis. Dogs are extremely susceptible to infection presenting clinical, pathological and immunological alterations very similar to human disease and are considered the most important model for evaluation of new treatment strategies (immunotherapy and immunochemo therapy). Herein, we evaluated the treatment strategy employing a therapeutic heterologous vaccine composed by antigens of *Leishmania braziliensis* associated with MPL adjuvant (LEMBPL vaccine) for visceral leishmaniasis (VL) in symptomatic dogs naturally infected by *L. infantum*.

2 Methods

Sixteen dogs received immunotherapy with MPL adjuvant (n=6) or with a vaccine composed by antigens of *L. braziliensis* associated with MPL (LEMBPL vaccine therapy, n=10). Dogs were submitted to an immunotherapeutic scheme consisting of 3 series composed of 10 subcutaneous doses with 10-day interval between each series. The animals were evaluated before (T0) and 90 days after treatment (T90) for their biochemical/hematological, immunological, clinical and parasitological variables.

3 Results

Our major results showed that the vaccine therapy with LEBMPL was able to restore and normalize main biochemical/hematological parameters. In addition, in an *ex vivo* analysis using flow cytometry, dogs treated with LEBMPL vaccine showed increased CD3+ T-lymphocytes and their subpopulations (TCD4+ and TCD8+), reduction of CD21+ B-lymphocytes, increased NK-cells (CD56+CD16+) and CD14+ monocytes. Under *in vitro* antigen stimulation, the animals developed a strong antigen-specific lymphoproliferation mainly by TCD4+ and TCD8+ cells; increasing in both TCD4+ IFN-γ+ and TCD8+ IFN-γ+ as well as reduction of TCD4+IL-4+ and TCD8+IL-4+ lymphocytes with an increased production of TNF-a and reduced levels of IL-10. Concerning the clinical signs of VL, the animals showed an important reduction in the number and intensity of it; increase body weight as well as reduction of splenomegaly. In addition, the LEBMPL immunotherapy also promoted a reduction in parasite burden assessed by Real Time PCR in the bone marrow and skin as well a reduction of parasite load in sand flies after xenodiagnosis.

4 Conclusions

The results obtained in this study highlighted the strong potential for the use of this heterologous vaccine therapy as an important strategy for VL treatment.

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