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JOURNAL OF INFECTIOUS DISEASES AND TREATMENT

Alteration of fucosylation profile of IgG Fc portion of dogs in different clinical manifestations of Canine Visceral Leishmaniasis

Gabriane Nascimento Porcino

Piaui, Brazil

Abstract

Statement of the Problem: Humoral immune response is detrimental in the pathogenesis of L. infantum in dogs, and antibody titer correlates with more severe clinical signs of the disease. Studies correlate IgG subclass and symptomatology to disease, but IgG N-glycosylation is poorly explored. Changes in the glycosylation profile may promote proinflammatory or antiinflammatory responses, depending on which glycan is altered (fucose, mannose, galactose, and sialic acid). It has been shown by the group that the IgG glycosylation profile changes in humans infected with L. infantum. However, the glycosylation profile in humans and dogs is different, and dogs have a higher amount of fucose. Our objective was to evaluate whether there is a difference in the fucosylation profile in the IgG Fc portion of specific anti-Leishmania antibodies to understand the pathogenesis.

Methodology & Theoretical Orientation: We used Enzyme-Linked Lectin Assay (ELLA) with L. infantum antigens treated with different enzymes (a1-2, 4, 6 fucosidase O (New England BioLabs®), IgGZERO LE (Genovis®) and PNGase F (New England BioLabs®)) to deglycosylation glycan residues and compare antibody titers to those found in the ELISA (Enzyme-Linked Immunosorbent Assay) from 45 dogs serum samples (15 symptomatic, 15 asymptomatic and 15 uninfected) provided by prof. Roque Pacheco de Almeida, Universidade Federal de Sergipe. Western blotting was performed to confirm the deglycosylation of antigen.

Findings: L. infantum promastigote in the metacyclic phase shows fucose residues, and PNGase F may be an option for antigen deglicosylation. The symptomatic and asymptomatic groups had statistically higher antibody titers compared to the control group. The serology of symptomatic, asymptomatic and controls dogs did not differ regarding the amount of fucose in different antigens under the conditions employed.

Conclusion & Significance: PNGase F should be used in antigen deglicosylation in different concentrations and more tests are necessary to see the difference in fucosylation profile in the Fc portion of IgG for specific anti-Leishmania antibodies.

Biography:

Gabriane Nascimento Porcino has her expertise in evaluation Leishmaniasis. She works with conserved domain from the L. braziliensis NTPDase wich is an important target for inhibitor design and the potential application of these biomolecules in experimental protocols of disease control (Porcino et al, 2012). She has evaluation of methods for detection of asymptomatic individuals infected with Leishmania infantum in the state of Piaui, Brazil (Porcino et al, 2019). The association of different techniques can detect asymptomatic infections in areas endemic for Visceral Leishmaniasis. She has looking for difference in N-glycans profile of Fc portion of IgG between individuals from endemic area to Leishmania infantum, asymptomatic and patients.Gabriane Nascimento Porcino has her expertise in evaluation Leishmaniasis. She works with conserved domain from the L. braziliensis NTPDase wich is an important target for inhibitor design and the potential application of these biomolecules in experimental protocols of disease control (Porcino et al, 2012). She has evaluation of methods for detection of asymptomatic individuals infected with Leishmania infantum in the state of Piaui, Brazil (Porcino et al, 2019). The association of different techniques can detect asymptomatic infections in areas endemic for Visceral Leishmaniasis. She has looking for difference in N-glycans profile of Fc portion of IgG between individuals from endemic area to Leishmania infantum, asymptomatic and patients.

Publications

1. Maia ACRG, Porcino GN, Quellis LR, Emídio NB, Marconato DG, Messias WF, Soldati LL, Faria-Pinto P, Capriles PVSZ, Coimbra ES, Marques MJ, Vasconcelos EG (2019) Leishmania infantum amastigote nucleoside triphosphate diphosphohydrolase 1 (NTPDase 1): Its inhibition as a new insight into mode of action of pentamidine. Experimental Parasitology 200: 1-6.
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Citation: Gabriane Nascimento Porcino, *Alteration of fucosylation profile of IgG Fc portion of dogs in different clinical manifestations of Canine Visceral Leishmaniasis*, Euro Immunology 2020, European Congress on Immunology, Edinburgh, Scotland, March 4 -5 , 2020, 05

J Infec Dis Treat
ISSN: 2472-1093

Volume 6 | Issue 3 | 05