

Evaluation of cytokine levels in sera of patients co-infected with *Strongyloides stercoralis* and HTLV-1

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*Strongyloides stercoralis* is one of the most common human gastrointestinal parasites in the world. This parasite is unique in its ability to replicate in the human host, permitting on-going cycles of auto-infection that can persist for decades without further exposure to exogenous infection. *S. stercoralis* infection can range from asymptomatic infections to chronic symptomatic strongyloidiasis. However, parasite uncontrolled multiplication (hyperinfection) and potentially life-threatening dissemination of larvae can occur in immunocompromised patients and results in a high death rate (up to 85%). One of the most commonly associated conditions to severe strongyloidiasis is HTLV-1 infection. Several studies point to the immune response unbalance as the main cause to severe strongyloidiasis in these individuals. The objective of this study is to evaluate the levels of cytokines in the sera of patients co-infected with *S. stercoralis* and HTLV-1. Serum from twelve individuals from the same family was collected between June and October 2016. The whole family had been previously diagnosed with HTLV-1 infection and three members were identified with *S. stercoralis* hyperinfection. Serum cytokine levels were measured by Cytometric Bead Array (CBA). The cytokines that demonstrated statistically significant difference between the patients coinfected and non-coinfected with *S. stercoralis* were IL-4 and TNF- $\alpha$ , where the mean between both groups were 1.94 and 1.82 pg/mL and 1.98 and 1.88 pg/mL, respectively ( $p < 0.05$ ). Similar to other helminth infections, strongyloidiasis elicits a Th-2 lymphocyte predominant immune response with production of cytokines, IgE antibodies, eosinophils, and mast cells which participate in the parasite expulsion and killing. Some studies demonstrated that HTLV-1 predisposes the patient to an immunologic shift to a Th-1 dominated immune response, reducing the Th-2 response. In this study coinfected patients presented high levels of IL-4 and TNF- $\alpha$ . An investigation with evaluation of cellular and humoral response is being conducted to better understand these results.

**Keywords:** *Strongyloides stercoralis*; HTLV-1; immune response