Activation of Hypothalamic-Pituitary-Adrenal axis in patients with visceral leishmaniasis

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INTRODUCTION

The Hypothalamic-Pituitary-Adrenal (HPA) axis is activated in response to stress. Studies have showed that in some infections there is elevation of cortisol or corticosterone and ACTH, indicating an activation of HPA axis. Glucocorticoids are hormones that affect the metabolism and immune response in several ways, including decreased production of proinflammatory cytokines. Leishmaniasis is a disease caused by protozoans of the genus *Leishmania* that is a serious health problem in several parts of the world including Brazil. *Leishmania* infection can lead to a wide spectrum of clinical manifestations: cutaneous leishmaniasis (CL), disseminated leishmaniasis (DL), mucosal leishmaniasis (ML), diffuse cutaneous leishmaniasis (DCL) and visceral leishmaniasis (VL). In the present work, we investigated whether patients with VL have changes in ACTH and cortisol levels and if these alterations are related to some clinical or immunological markers of disease. MATERIAL AND METHODS We evaluated a group of patients with VL (n=37) and healthy volunteers (n=34) with ages ranging from 2 to 11 years and similar body mass index (BMI). Hormones (ACTH and cortisol) were quantified using multiplex bead-based Luminex technology and cytokines (IL1β, TNF-α, IL-6,IL-8,IL-10,IL-12,IFN-γ) were determinate by cytometric beads array (CBA). RESULTS AND DISCUSSION Individuals with VL exhibited higher levels of cortisol (14.79 ng/mL ±11.13) and ACTH (9.040 pg/mL±26.42) than controls (12.00 ng/mL±1.831, P=0.0004 and 1.880 pg/mL±48.08, P<0.0001, respectively).Levels of cortisol positively correlated with time of disease (r= 0.4105, P=0.04), respiratory frequency (r=0.44 P=0.015) and IL-6 (r=0.389, P=0.0405). ACTH positively correlated with TNF-α (r=0.3769, P=0.040) and IL-1β (r=0.3762, P=0.0405). CONCLUSIONS: These results indicate that patients with VL have an activation of the HPA axis and that this activation could be associated with the outcome of disease. The elevation of some cytokines as IL-6 could be involved in the HPA activation and increase of cortisol.

Key Works: Cortisol, HPA axis, visceral leishmaniasis

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