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Poster presentation

A multiparameter panel for the staging of human African trypanosomiasis patients

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Background

Human African trypanosomiasis (HAT), also known as sleeping sickness, is a parasitic tropical disease. It progresses from stage 1 or early phase, when parasites are present in blood and/or lymph, to stage 2 or late stage when parasites have invaded the central nervous system (CNS). As treatment depends on the stage of disease, there is an urgent need for tools that can efficiently discriminate the two stages of HAT. In this context, we hypothesized that markers of brain damage discovered by proteomic strategies as well as cytokines and chemokines could individually or in combination indicate the CNS invasion by the parasite.

Methods

Patients consulting a trypanosomiasis treatment centre in D.R. Congo and infected by *Trypanosoma brucei gambiense* were investigated in this study. They were staged on the basis of the cerebrospinal fluid (CSF) white blood cell count (WBC) and presence of the parasite in CSF. A total of 100 CSF samples, comprising 21 stage 1 (< 5 WBC/μL), 8 intermediate stage (between 5 and 20 WBC/μL) and 71 stage 2 (> 20 WBC/μL), were analysed. CSF concentrations of H-FABP, GSTP-1 and S100β were measured by enzyme-linked immunosorbent assays (ELISA). The levels of thirteen cytokines and chemokines (IL-1ra, IL-1β, IL-6, IL-8, IL-9, IL-10, G-CSF, MIP-1β, VEGF, IFN-γ, MCP-1, TNF-α and IP-10) were determined by bead suspension arrays.

Results

IP-10 was the best individual molecule able to distinguish between stage 1 and stage 2 patients with a sensitivity of 91% and a specificity of 100%. Multivariate analysis defined a panel characterized of GSTP1 (> 5.05 ng/ml), IP-10 (> 2204 pg/ml) and IL-8 (> 102.4 pg/ml), where stage 2 patients were identified with a sensitivity of 97% and a specificity of 100%, when at least one of the 3 molecules is above the cut-off.

Conclusion

This study highlights the value of IP-10 as a single biomarker for staging HAT patients. Its further combination with GSTP1 and IL-8 results in a panel that efficiently identifies stage 2 HAT patients.

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