ABSTRACT

Mycobacterium tuberculosis (Mtb) infects nearly 2 million people annually and is the most common cause of death in HIV-infected individuals. Tuberculosis (TB) diagnostics cater to HIV-uninfected individuals in non-endemic countries, are expensive, slow, and lack sensitivity for those most affected. Patterns of soluble immune markers from Mtb-stimulated immune cells are not well defined in HIV co-infection. We assessed immune differences between HIV-infected and HIV-uninfected individuals with active TB utilizing IFNγ-based QuantiFERON®-TB Gold In-Tube (QFT) testing in Nairobi, Kenya. Excess QFT supernatants were used to measure cytokine and chemokine responses by a 17-plex bead array. Mtb/HIV co-infected participants were significantly less likely to be QFT+ (47.2% versus 84.2% in the HIV-uninfected group), and demonstrated lower expression of all cytokines except for IFNα2. Receiver operator characteristic analyses identified IL-1α as a potential marker of co-infection. Among HIV-infected individuals, CD4+ T cell count correlated weakly with the expression of several analytes. Co-expression analysis highlighted differences in immune profiles between the groups. These data suggest that there is a unique and detectable Mtb-specific immune response in co-infection. A better understanding of Mtb immunology can translate into much needed immunodiagnostics with enhanced sensitivity in HIV-infected individuals, facilitating their opportunity to obtain live-saving treatment.