The fraction of perforin-expressing HIV-specific CD8 T cells is a marker for disease progression in HIV infection

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OBJECTIVE: Perforin is an important component of the death machinery of cytotoxic T cells (CTL). To evaluate functional differences between HIV- and cytomegalovirus (CMV)-specific CTL of coinfected patients, the frequencies of the respective perforin-expressing T cells were analysed in a rapid whole blood assay. METHODS: Whole blood of HIV- and CMV-infected individuals was specifically stimulated by HIV-1 Pr55(gag) or complete CMV antigen, and activation-induced intracellular cytokine and perforin expression in CD8 T cells was analysed by flow cytometry. RESULTS: Perforin-expressing HIV-1- and CMV-specific CD8 T cells can be quantified simultaneously. Within a patient, the frequency of such HIV-specific CD8 T cells in peripheral blood was lower than the frequency of the respective CMV-specific cells. The number of the perforin-expressing HIV-specific CD8 T cells inversely correlated with the peripheral blood CD4 T cell count. CONCLUSIONS: The differential fractions of perforin-expressing virus-specific CD8 T cells in HIV and CMV double infection might be caused by differences in priming and trafficking to or from replication sites. However, without knowing the underlying mechanism, the fraction of perforin-expressing HIV-specific CD8 T cells provides another surrogate marker for disease progression.