

## Increased frequency of activated cytotoxic T-lymphocytes in HIV infected patients facilitate HIV associated dementia

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**Background:** The advanced stage of HIV-1 disease may manifest into a variety of central nervous system disorders. The neurons may get damaged because of direct infection with the virus as well as indirectly due to the immune response. CD8<sup>+</sup> Cytotoxic T-lymphocytes are proposed to be responsible for HIV associated dementia, but the exact mechanisms have yet not been elucidated.

**Methodology:** HIV<sup>+</sup> females with dementia score either <7.5 and non-demented HIV<sup>+</sup> score >7.5 were recruited along with age matched healthy controls. Peripheral blood mononuclear cells were phenotyped for CTL markers along with CD127, CD45RA and CD45RO. CTLs expressing intracellular perforin and granzyme B were also enumerated. Among cytokines IFN $\gamma$  and IL-7 levels estimated. The results were analyzed using appropriate statistical tools.

**Results:** Among HAD group the mean CD4 count was 269 cells/ $\mu$ L, and viral load 19095 copies/ml, while the non-demented individuals had normal CD4 count of 485 cells/ $\mu$ L with lower quantity of viral RNA (7527 copies/ml). The HAD group had significantly lower number (9.8%) of CD4<sup>+</sup> CD127<sup>+</sup> cells compared to 17.04% in ND group and 32.18% in HCs. The frequency of CTLs expressing CD127 was 14.34% among demented individuals as compared to 18.67% in non-demented patients. The significantly higher proportion of CTLs from HAD patients expressed Granzyme B and Perforin (59.4+20.9 and 34.05+19.09 respectively) as compared to non-demented patients (47.5+19.55 and 26.94+16.17). The dementia score was significantly correlated with the frequency of CD8<sup>+</sup> cells expressing Granzyme B indicating a direct association.

**Conclusions:** The findings suggest that the proliferation of terminally differentiated and activated CD8<sup>+</sup> cells in the HIV patients with prolonged disease, may be associated with enhanced killing of neuronal cells leading to dementia.

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