

# Central nervous cytokine patterns in different stages of HIV infection

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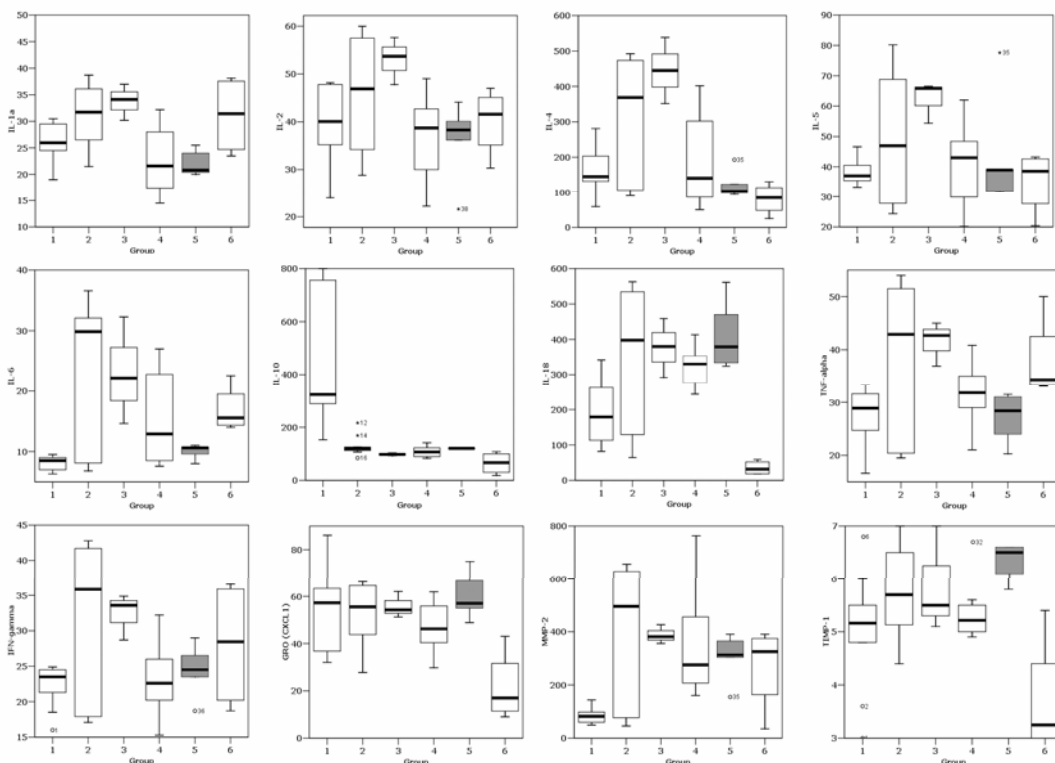
## Background:

It is well known that cytokine patterns in the central nervous system (CNS) of HIV infected individuals differ from the uninfected population. But it is unknown whether there is an inflammatory or anti-inflammatory, pro-apoptotic or anti-apoptotic cytokine environment in different stages of HIV-infection. The same is true for the influence of highly active antiretroviral therapy on cytokine patterns.

## Methods:

33 HIV-positive, neurological asymptomatic individuals, subdivided into non-AIDS and AIDS (CDC) patients and subdivided being on HAART or not (Group 1-4), were included in the presented study. Their cerebrospinal fluid (VCSF) data were compared with those of 5 HIV-negative healthy controls (Group 5) and serum levels of untreated non-AIDS patients (Group 6). Cytokine levels in CSF were detected simultaneously with an antibody array.

**Results:**



Cytokines are presented as normalized values in comparison with internal positive controls: **Higher** values on the y-axis are representing **lower** cytokine levels in CSF. The positive control fluorescence was x times stronger! Healthy controls are represented by dark boxes.

Table: Demographics	N	Age (Years)	HIV duration (Years)	CD4+ cells	VL-Plasma (Log10)	VL-CSF (Log10)
Non-AIDS No HAART (Gr.1)	10	40.4 ± 14.5	3.4 ± 4.1	531 ± 165	4.1 ± 0.5	2.9 ± 1.1
Non-AIDS HAART (Gr.2)	10	41.7 ± 3.9	10.1 ± 4.9	673 ± 265	0.5 ± 0.8	0.8 ± 1.1
AIDS No HAART (Gr.3)	3	41.7 ± 8.9	7.0 ± 6.6	707 ± 602	3.2 ± 1.3	1.3 ± 2.3
AIDS HAART (Gr.4)	10	49.3 ± 10.9	12.2 ± 5.4	407 ± 216	1.0 ± 1.4	0.4 ± 0.9

## Conclusions:

HIV-1 provokes a long lasting inflammatory reaction in the CSF. This inflammation can be reduced by HAART in non-AIDS patients. The inflammatory CSF reaction reappears in AIDS patients independently from HAART. This can be an explanation for the absence of a positive HAART-influence on neuropsychological impairment that is globally detected in the majority of NeuroAIDS cohorts. Thus, anti-inflammatory therapeutic interventions combined with an early start of HAART may be beneficial in HIV-patients.