

# Distinct neuropsychological deficit patterns in HIV-1 positive patients with higher CSF than plasma viral load

Arendt G.<sup>1</sup>, Nolting T.<sup>1</sup>, Husstedt I.-W.<sup>2</sup>, Gregor N.<sup>2</sup>, Koutsilieri E.<sup>3</sup>, Maschke M.<sup>4</sup>, Obermann M.<sup>4</sup>, Sopper S.<sup>5</sup>, Riederer P.<sup>3</sup>, ter Meulen V.<sup>6</sup>

<sup>1</sup> Dept. of Neurology, University Hospital of Duesseldorf, Germany

<sup>2</sup> Dept. of Neurology, University Hospital of Muenster, Germany

<sup>3</sup> Dept. of Psychiatry, Neurochemistry, University Hospital of Wuerzburg, Germany

<sup>4</sup> Dept. of Neurology, University Hospital of Essen-Duisburg, Germany

<sup>5</sup> German Primate Centre, Goettingen, Germany

<sup>6</sup> Dept. of Virology and Immunobiology, University of Wuerzburg, Germany

**Competence Network HIV/AIDS**



## Background:

The significance of cerebrospinal fluid (CSF) viral load (VL) for cerebral dysfunction in HIV-1-positive patients is unclear. This study presents the results of a broad neuropsychological test battery that was used to examine 153 HIV-positive patients without overt neurological deficits.

## Methods:

Patients were recruited consecutively. 120/153 HIV-1 carriers had higher plasma than CSF-VL, 33 (21.6 %) vice versa. Both patient groups were subdivided into six subgroups: Groups 1 + 2 = early CDC stage (A1+2, B1+2) patients +/- HAART, groups 3 + 4 = late CDC stage (A3, B3, C1-3) patients +/- HAART, groups 5+6 = drug abusers +/- HAART.

**Results:**

Group VL-Plasma > VL-CSF	Age (years)	CD4 cell count	VL- Plasma (Log10)	VL-CSF (Log10)	N
Early CDC no HAART (1)	41.2 ± 11.6	535 ± 226	3.86 ± 0.81	2.63 ± 0.99	29
Early CDC with HAART (2)	45.8 ± 9.2	571 ± 311	0.69 ± 1.02	0.25 ± 0.61	27
Late CDC no HAART (3)	46.9 ± 8.4	395 ± 515	3.81 ± 1.55	2.28 ± 2.02	6
Late CDC with HAART (4)	46.9 ± 9.7	430 ± 295	1.57 ± 1.76	0.77 ± 1.12	48
Drug abuse no HAART (5)	38.8 ± 7.8	366 ± 305	4.27 ± 0.44	3.61 ± 0.67	4
Drug abuse with HAART (6)	35.6 ± 10.8	646 ± 224	1.62 ± 1.45	0.85 ± 0.93	6

Group VL-CSF > VL- Plasma	Age (years)	CD4 cell count	VL- Plasma (Log10)	VL-CSF (Log10)	N
Early CDC no HAART	39.5 ± 11.1	474 ± 198	3.26 ± 0.82	3.45 ± 1.07	7
Early CDC with HAART	46.1 ± 6.3	624 ± 266	1.29 ± 0.89	1.9 ± 0.24	7
Late CDC no HAART	41.2 ± 14.4	112 ± 69	3.88 ± 0.89	4.65 ± 0.82	4
Late CDC with HAART	45.7 ± 5.8	397 ± 320	1.72 ± 1.82	2.50 ± 0.93	12

Drug users not shown due to small sample size (n=3).

Patients with VL-CSF > VL-Plasma		Groups with neuropsychological impairment		
	Tests	Mild	Moderate	Severe
Pure Motor Test	Contraction Right Contraction Left	1 1,2	3,4,6 4,6	5 3,5
Motor/Cognitive Tests	TMT A TMT B Digit Span Test	- - -	4,5,6 4,5,6 -	3 3 -
Motor/Cognitive/ Visual Test (grooved pegboard)	Dominant hand Non-dom. hand	- 1,4,5	- -	3 3
Pure cognitive Tests	AIDS-Dementia Scale Syndrome Short Test	- 1	5 5	3 3

Patients with VL-Plasma > VL-CSF		Groups with neuropsychological impairment		
	Tests	Mild	Moderate	Severe
Pure Motor Test	Contraction Right Contraction Left	1-4 2,4	- 1,3	-
Motor/Cognitive Tests	TMT A TMT B Digit Span Test	- - -	- - -	- 3 -

## Conclusions:

HIV-1-positive patients without overt clinical deficits, but with higher CSF than plasma VL - a surprisingly high percentage in this cohort - showed marked pathological neuropsychological test profiles in contrast to individuals with higher plasma VL who reveal only mild to moderate motor, but no cognitive deficits. The reasons for these findings have to be evaluated in further studies.