

Low prevalence of neurocognitive impairment in a Swedish cohort of HIV-1 infected individuals

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Background

The prevalence of HIV-associated neurocognitive disease (HAND) is not clear. Cross-sectional studies report prevalence rates above 50% (Heaton 2010, Simioni 2010). Garvey et al (2011) found 19% of treated patients with cognitive impairment using computerized testing. The CogState Brief Battery as been shown to have an acceptable construct validity where measures of processing speed, attention, working memory and learning showed strong correlations with conventional neuropsychological measures (Maruff 2009) and larger test battery has been validated in patients with AIDS and ADC (Cysique 2006). 90% of patients with HIV, without dementia, were accurately classified as being cognitively impaired or not by CogState testing (Overton 2011).

CogState Brief Battery

Test	Cognitive domains
Detection	Psychomotor function
Identification	Speed of information processing and attention
One Card Learning	Learning
One Back	Working memory and attention

Method

This is a cross-sectional analysis of 91 HIV-1 infected individuals who performed a LP and CogState Brief Battery between January 2011 and July 2013. Mean age was 46 yrs, 74% men and 26% women. Transmission route was: heterosexual 64 %, homosexual 32 %, iv-drug use 2%, blood transfusion 1% and mother to child transmission in 1%. 58 (64 %) were on antiretroviral treatment (ART) and it was PI based in 59%. Two patients (2%) had an ongoing substance abuse. Seven had previous or ongoing CNS symptoms.

The CogState Brief Battery consists of four tests: Detection, Identification, One card learning and One back test.

Patients answered these questions:

1. Do you feel depressed?
2. Do you experience memory or concentration difficulties?
3. Do you have problems performing your work or in your daily activities such as shopping, paying bills or home maintenance?"

CSF was analyzed for white blood cell count (WBC), HIV RNA, neurofilament light protein (NFL), β 2-microglobulin, neopterin and IgG-index. Plasma was analyzed for CD4-cell count, HIV RNA, neopterin and β 2-microglobulin.

Conclusions

This study indicates a low prevalence of HAND in this well treated cohort with few confounding factors. 3% were classified with MND and none with HAD. The majority (75%) performed normally in all four cognitive tests and would not have been classified with ANI, MND or HAD even if one more cognitive domain was assessed. Memory and concentration difficulties were reported by 29% and correlated with low CD4-cell counts and symptoms of depression, but not with CSF variables.

Results

88% of patients on ART had plasma HIV RNA <50 cop/mL and 93% had CSF HIV RNA <50 cop/mL. 8 (9%) performed <1 SD on two or more NC tests. 5/8 (6%) of them reported memory or concentration difficulties, and 3(3%) had difficulties in ADL, classified as HIV-1 associated mild neurocognitive disorder (MND). 75% of all patients performed within 1 SD in all four tests. 26 (29%) had memory or concentration difficulties and they had lower mean CD4 cell count (336 cells/ μ L) than asymptomatic patients (496 cells/ μ L) ($p < 0.05$), lower nadir CD4 cell count (116 cells/ μ L vs 201 cells/ μ L, $p < 0.01$) more problems in ADL ($p < 0.01$) and symptoms of depression ($p < 0.0001$). No differences were found between groups in CogState performance or CSF variables.

All results remained adjusting for ART. There were no differences between patients on ART and naive patients regarding neurocognitive performance, memory or concentration difficulties, symptoms of depression or ADL problems.

	Patients with cognitive symptoms	Patients without cognitive symptoms	p
n (%)	26 (29%)	65 (71%)	-
CD4-cell count (cells/ μ L)	336	496	$p < 0.05$
Nadir CD4-cell count (cells/ μ L)	116	201	$p < 0.01$
Report ADL difficulties n (%)	7 (27%)	2 (3%)	$p < 0.01$
Depressive symptoms n (%)	12 (46%)	4 (6%)	$p < 0.0001$

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