Correlates of Cerebral White Matter Hyperintensities in HIV-positive Patients

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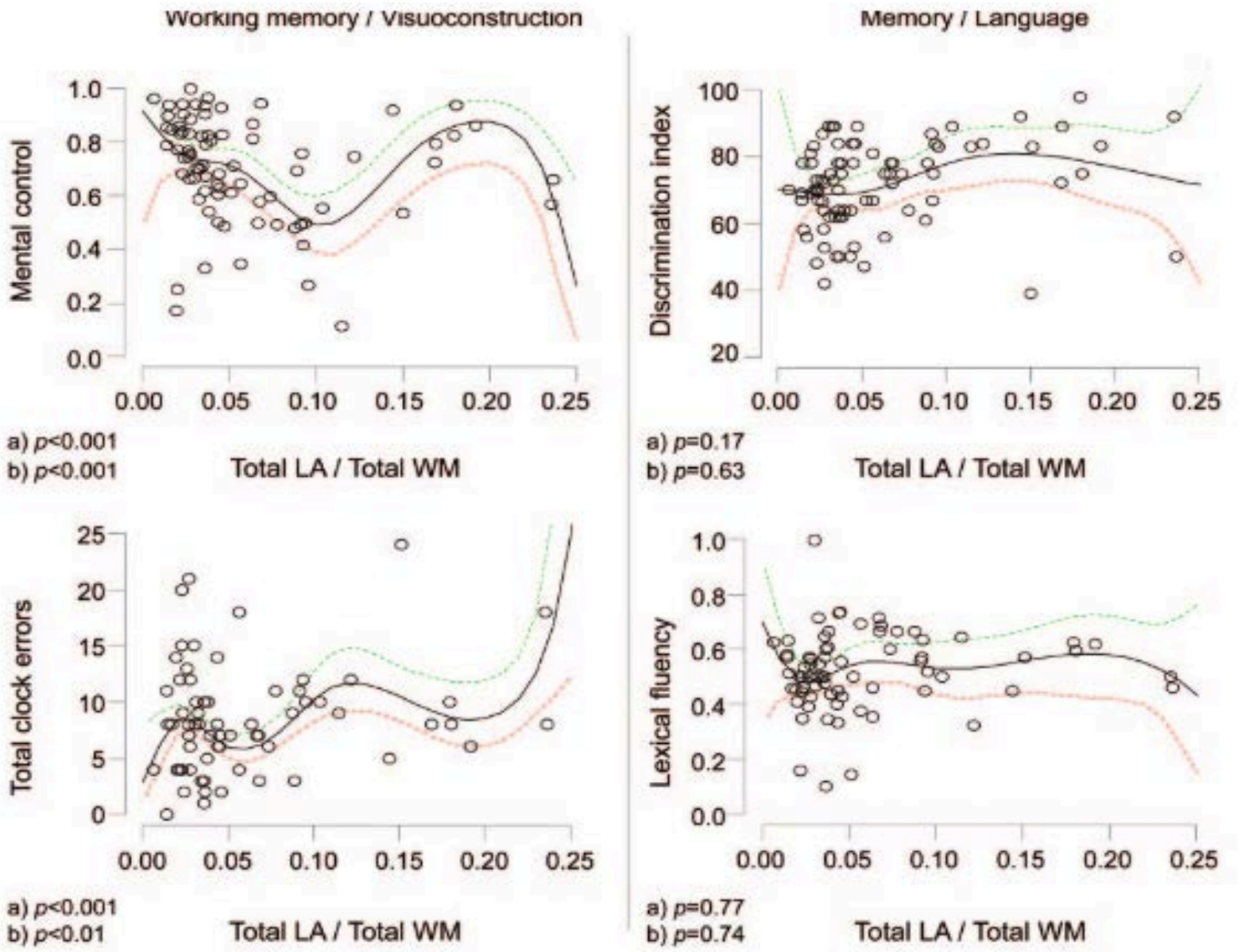
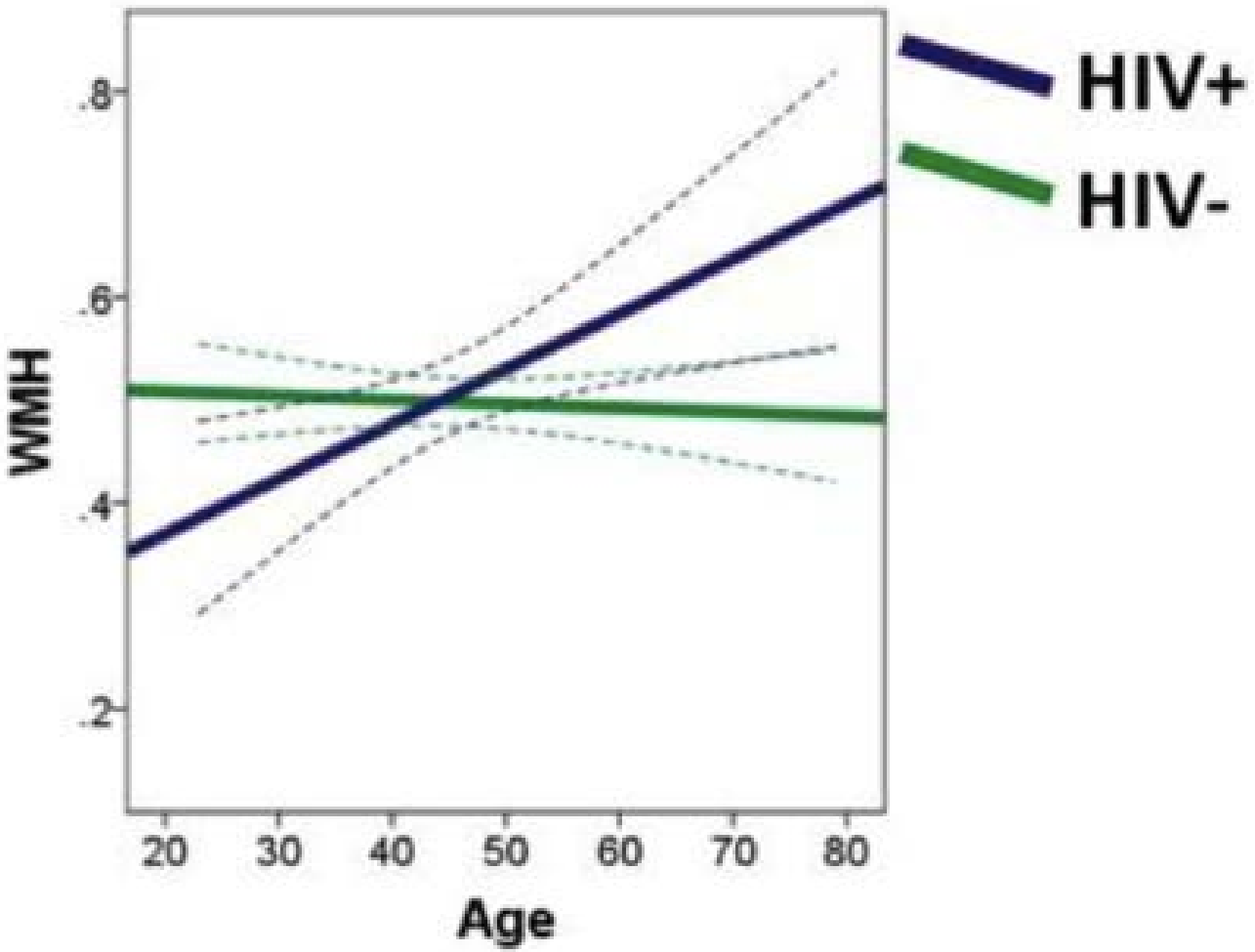
Giacomo Stroffolini has no financial relationships with commercial entities to disclose



From Price CC, et al. Neurology 2012

Background II



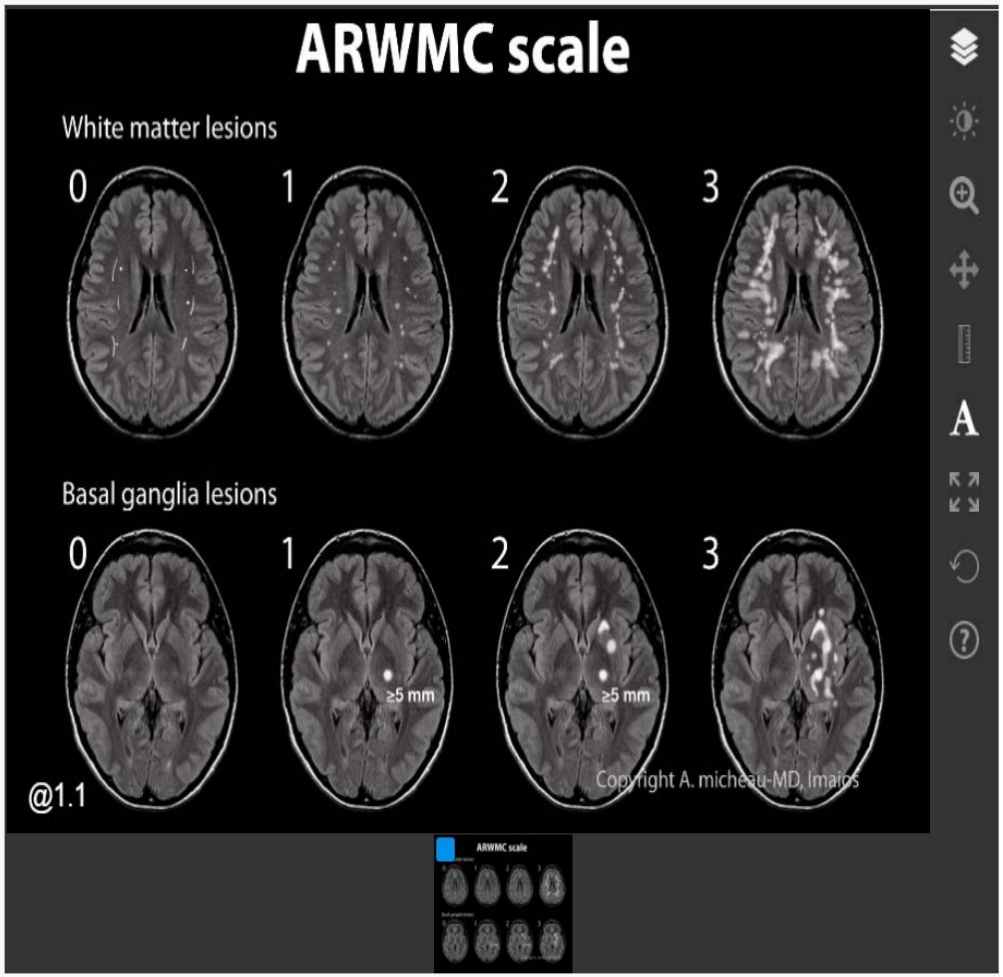
From Seider Tl, et al. JNV 2016

Objectives

Aim of this study was to grade WMHs in HIV positive individuals using a simple visual scale and to
explore their severity with clinical, neurocognitive and biomarker characteristics.

Material and methods

- 107 Patient underwent LP for clinical reasons; opportunistic cns infection, neoplasm and open neurological disorder were exclusion



The ARWMC Rating Scale for MRI and CT

	White matter lesions
0	No lesions (including symmetrical, well-defined caps or bands)
1	Focal lesions
2	Beginning confluence of lesions
3	Diffuse involvement of the entire region, with or without involvement of U fibers
	Basal ganglia lesions
0	No lesions
1	1 focal lesion (≥5 mm)
2	>1 focal lesion
3	Confluent lesions

battery according to Frascati criteria administered by trained Neuropsychologist

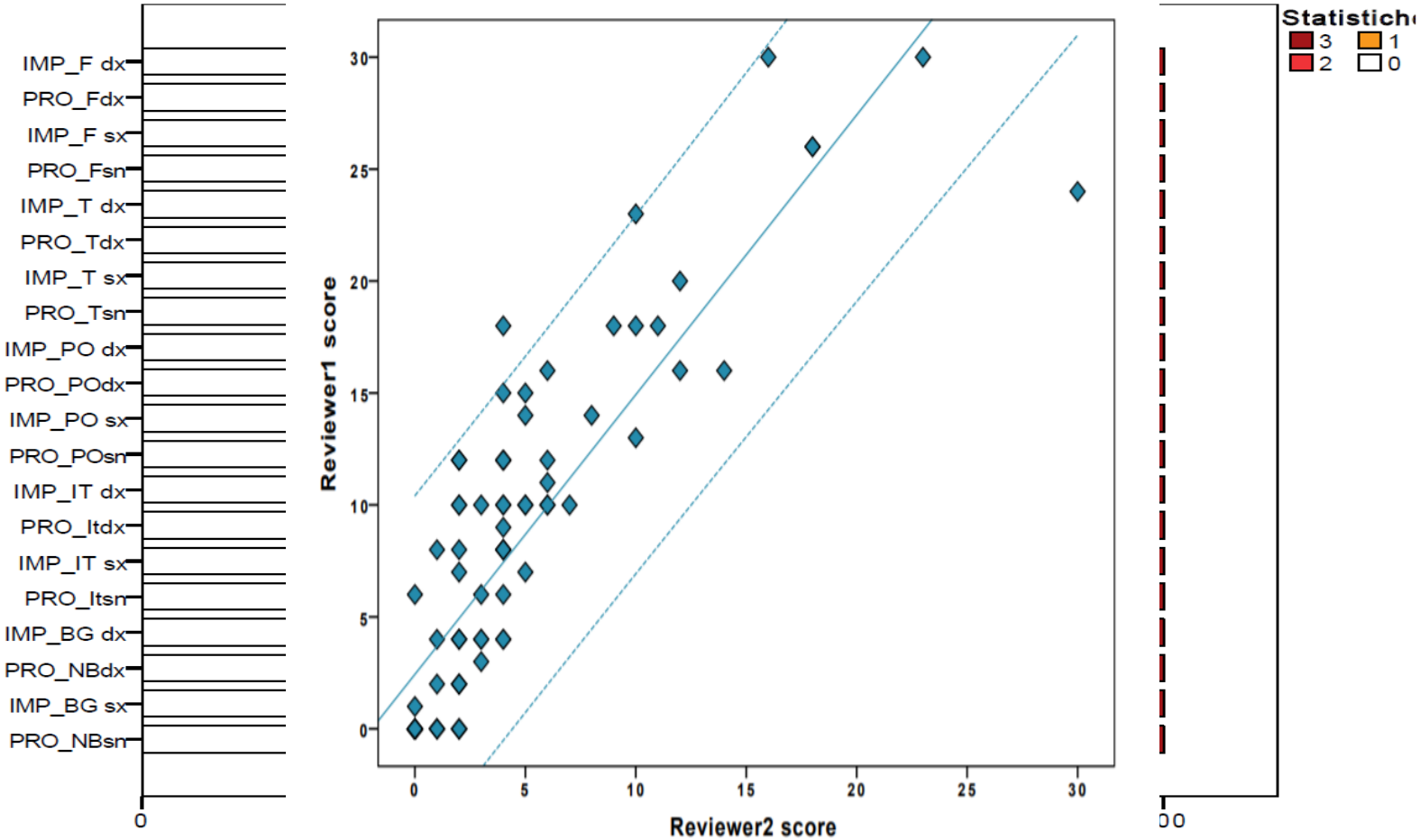
From Xiong Y, et al. EJN 2011

Study Population: Demographic

	Naive	cART-treated
N	55	52
Age: years	46 (39-50)	47 (40-56)
Male gender: n (%)	43 (78.2%)	39 (75%)
BMI: Kg/m^2	22.4 (19.9-26.1)	23.7 (20.9-25.7)
CD4: Cells/uL	67 (29-133)	321 (106-544)
CD4 nadir: Cells/uL	58 (25-113)	48 (23-148)
plasma HIV RNA: Log_{10} copies/mL	5.32 (4.90-5.93)	<1.28 (<1.28-1.75)
plasma HIV RNA <50 copies/mL	0	38 (73.1%)
CSF HIV RNA: Log_{10} copies/mL	4.12 (3.38-4.80)	1.49 (<1.28-2.1)
CSF HIV RNA <50 copies/mL	1 (1.9%)	30 (60%)
CSF HIV RNA > plasma HIV RNA	2 (3.7%)	21 (42%)
Duration of HIV infection: months	1.5 (0.5-134)	116 (28.3-223-6)
ARV classes: NNRTI	-	11 (21.1%)
PI	-	32 (61.5%)
INSTI	-	7 (13.5%)
Other classes	-	2 (3.8%)
Indication for LP: Late Presentation	13 (23.6%)	-
Opportunistic Infections	28 (50.9%)	4 (7.7%)
HAND	9 (16.4%)	10 (19.2%)
Headache	1 (1.8%)	3 (5.8%)
WMHs	4 (7.3%)	8 (15.4%)
Longitudinal studies	-	16 (30.8%)
Neurological symptoms	-	14 (26.9%)
Comorbidities: hypertension	8 (14.5%)	6 (11.5%)
dyslipidemia	0	2 (3.8%)
cardiovascular disease	0	1 (1.9%)
diabetes	0	3 (5.8%)
chronic renal impairment	3 (5.4%)	3 (5.8%)
chronic hepatitis	11 (20%)	8 (15.4%)
Statin use	2 (3.5%)	4 (7.8%)

Results II: Scored regions

Average score identified 70 patients (66.6%) with WMHs

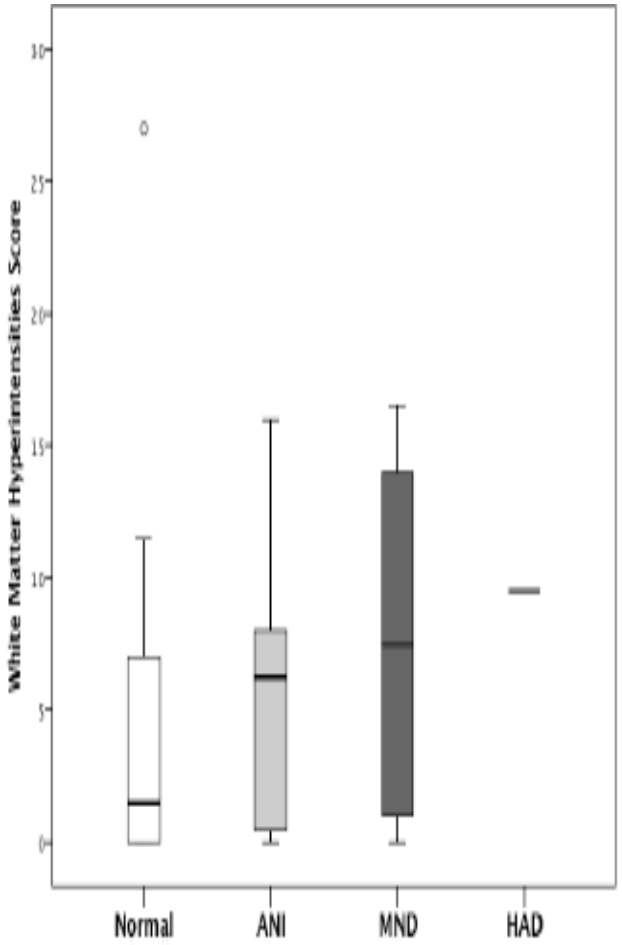


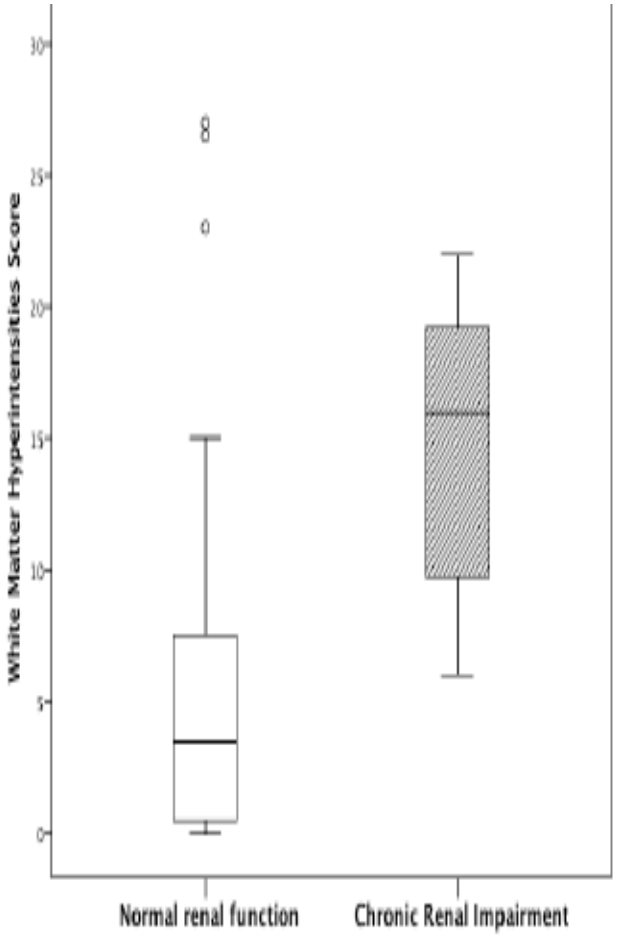
WMA scores showed a good correlation (rho=0.869, p<0.001, kappa=0.43) between the two reviewers. The correlation was higher for frontal lobes (rho values = 0.788 right and 0.815 left) and lower for basal ganglia (rho values = 0.505 right and 0.308 left).

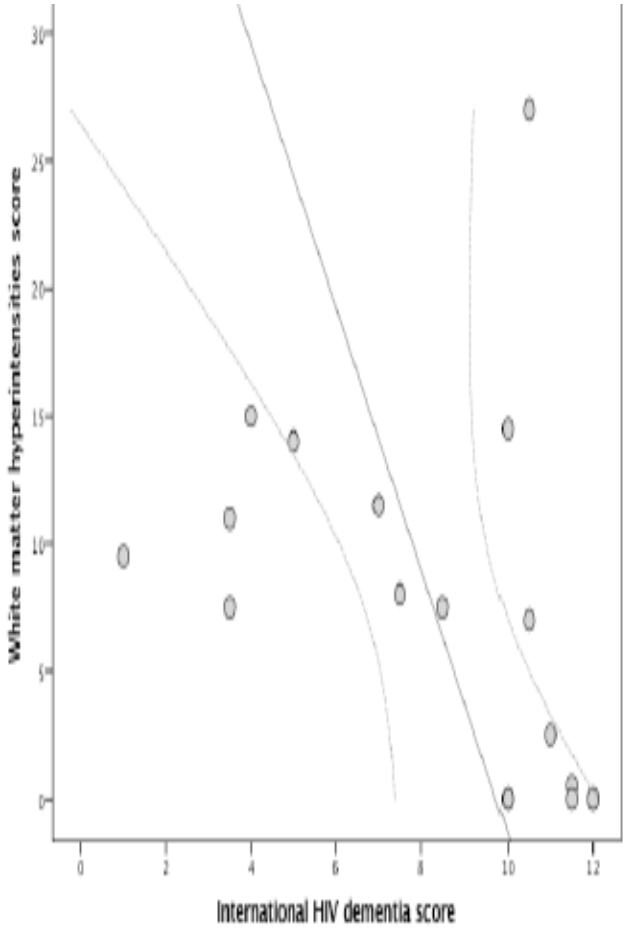
Results III: Correlates of WMHs

	Naive	cART-treated
Age	0.051 (0.275)	**0.001 (0.463)**
BMI	0.760 (0.064)	0.979 (-0.004)
CD4+ T cell count	0.489 (0.099)	0.569 (-0.087)
Nadir CD4+ T cell count	0.393 (0.123)	0.186 (-0.222)
Plasma HIV RNA	0.754 (-0.045)	0.548 (0.092)
CSF HIV RNA	**0.006 (0.381)**	0.821 (0.035)
CSF to plasma HIV RNA ratio	0.070 (0.258)	0.799 (0.040)
Duration of HIV infection	**0.009 (0.400)**	**0.001 (0.504)**
CPE score	NA	0.758 (-0.048)
Male gender	0.933 (201)	0.121 (128)
Plasma HIV RNA <50 copies/mL	NA	0.728 (184)
CSF HIV RNA <50 copies/mL	NA	0.629 (205)
Protease Inhibitor based regimen	NA	0.745 (174)
Statin use	0.192 (6)	0.594 (67)
Hypertension	0.530 (148)	0.111 (69.5)
Diabetes	NA	0.105 (27.5)
Chronic Hepatitis	**0.009 (96.5)**	0.491 (81)
Chronic Renal Impairment	**0.020 (14.5)**	**0.025 (26)**

Results IV: Neurocognitive tests







Conclusions

-WMHs were found in 66.6% of patients: their severity was associated with duration of HIV infection, hepatic and particularly renal impairment

-We were not able to observe consistent associations between plasma and CSF biomarkers and WMHs scores.

-Using full neurocognitive examination 64% of naïve and 65% of treated patients were diagnosed with HAND. In these patients WMHs scores were higher particularly in cART treated individuals. Visuo-spatial and memory areas were more compromised.

-WMHs entity should be considered in HIV infected patients specially when evaluating patients with NC impairment; studies are warranted for delivering tailored interventions, statins and antihypertensive therapies could play an important role

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