

## A LOWER CD4/CD8 RATIO IS PREDICTIVE OF SUBCORTICO-FRONTAL BRAIN ATROPHY IN VIRALLY-SUPPRESSED HIV-INFECTED PERSONS

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**Background:** Most MRI volumetric studies in HIV infection have been conducted in non-virally suppressed persons and/or without appropriate control groups. To address this issue, we determine the magnitude of brain volume change in a HIV+ cohort entirely composed of virally suppressed individuals in comparison to demographically and life style comparable controls; and determined which clinical and chronic HIV biomarkers predicted brain atrophy.

**Methods:** 92 HIV+ and 50 HIV- participants (*Mean* age=57) underwent high-resolution anatomical MRI scanning, neuropsychological evaluation, and HIV laboratory tests. MRIs were processed via the automated segmentation software, FreeSurfer. Total cortical volume, total white matter (WM) volume, basal ganglia, lateral ventricles, fronto-striatal and fronto-parietal WM volumes were measured with reference to total intracranial volume. Neurocognitive performance was summarized using Global Deficit Score (GDS) method and neurocognitive impairment (NCI) was defined dichotomously as GDS $\geq$ 0.5. History of HIV-related NCI (yes/no) was also obtained. HIV status group differences and the effects of age and NCI on volumes of interest were assessed using multivariate analyses of variance, while multiple linear regression was used to assess the effects of HIV biomarkers.

**Results:** The HIV+ group demonstrated predominant subcortical grey ( $d=0.50-0.60$ ) and WM ( $d=0.43-0.69$ ) atrophy, while the cortex was relatively spared ( $d=0.23$ ). Historical and current NCI were separately associated with caudal-middle-frontal and superior-frontal WM atrophy. Caudal-middle-frontal WM volumes were smaller in those with both historical and current NCI than when only one or neither were present. The inferior-parietal WM was smaller in the HIV+ group compared to controls as a function of age. Finally, lower CD4/CD8 ratio was associated with volume loss across several subcortical grey and WM regions.

**Conclusion:** Virally suppressed HIV+ individuals show moderate subcortical grey and WM atrophy and mild cortical atrophy, which is the product of historical and ongoing brain damage principally related to chronic immune activation.

### Disclosure of Interest Statement:

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