White matter hyperintensity load is associated with premature brain aging

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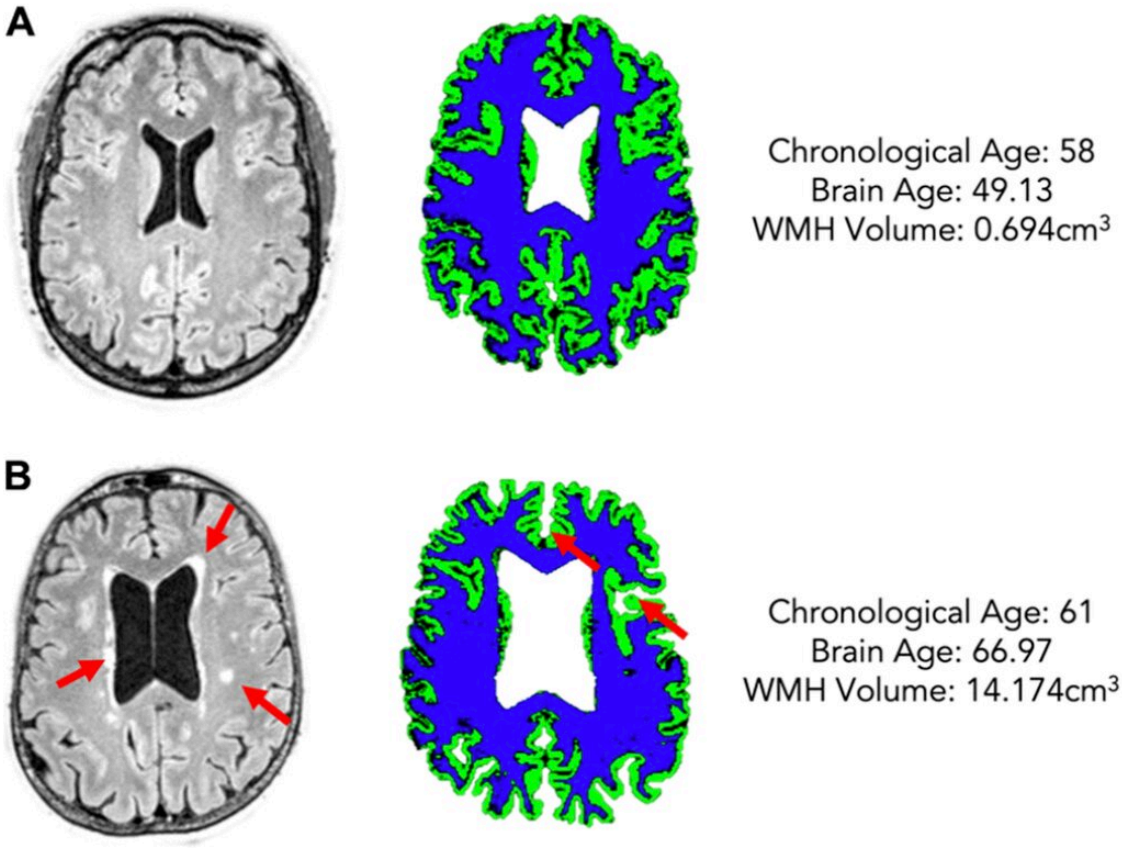

Two example participants of a similar chronological age (A: 58, B: 61) but different estimated brain age (A: 49.13, B: 66.97) and different WMH volume (A: 0.694cm3, B: 14.174cm3). The left column shows FLAIR scans with WMHs highlighted by red arrows, the right shows grey matter (green) and white matter (blue) maps for each participant. Credit: *Aging* (2022). DOI: 10.18632/aging.204397

A new research paper titled "White matter hyperintensity load is associated with premature brain aging" has been published in *Aging*.

Brain age is an MRI-derived estimate of brain tissue loss that has a similar pattern to aging-related atrophy. White matter hyperintensities (WMHs) are neuroimaging markers of small vessel disease and may represent subtle signs of brain compromise.

In this new study, researchers from University of South Carolina, Medical University of South Carolina and Emory University tested the hypothesis that WMHs are independently associated with premature brain age in an original aging cohort.

"We hypothesized that a higher WMH load is linearly associated with premature brain aging controlling for chronological age," they explain.

Brain age was calculated using machine-learning on whole-brain tissue estimates from T1-weighted images using the BrainAgeR analysis pipeline in 166 healthy adult participants. WMHs were manually delineated on FLAIR images. WMH load was defined as the cumulative volume of WMHs. A positive difference between estimated brain age and chronological age (BrainGAP) was used as a measure of premature brain aging. Then, partial Pearson correlations between BrainGAP and volume of WMHs were calculated (accounting for chronological age).

Brain and chronological age were strongly correlated ($r(163)=0.932$, p