White Matter Hyperintensity Regression is Associated with Better Executive Function

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Abstracts will be considered for both poster and platform presentations

Cognitive/Behavioral disorders

Introduction: White matter hyperintensities (WMH) represent vascular injury leading to cognitive sequalae associated with dementia. Although WMH stability and progression are better understood, the concept of regression is less well developed. The data presented suggests longitudinal WMH changes should include a regression category.

Methods: A sample of 377 participants were examined from the Alzheimer's Disease Neuroimaging Initiative 2 (ADNI2) with WMH quantification, structural brain measures (i.e. brain volume), and cognitive measures (memory and executive function) both at baseline and approximately 2 years later. Changes in these measures (Δ) were calculated. Participants were ultimately categorized into three groups: Regression, Stable, and Progression

Results: There were no significant differences between groups in age, education, gender, or diagnosis. Analysis of variance (ANOVA) revealed that there were significant differences in Δ brain volume composite between progression and regression (p = 0.004) and progression and stable groups (p = 0.014). Δ Memory was significantly greater in regression and stable groups compared to progression (p = 0.003; p = 0.018). There were no differences between any groups in Δ executive function (EF; p = 0.31). However, within group analysis showed that in the regression group, Δ WMH was negatively associated with Δ EF (p = 0.041).

Discussion: WMH regression is associated with decreased brain atrophy and improvement in memory performance over a period of two years compared to subjects with WMH progression. Δ EF was only associated with Δ WMH in the regression group. These results suggest implementation of three WMH categories may help guide patient prognosis in the future.