

Session/Poster#

Presenter

A05

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Relationship Between Spinal Cord and Cerebral White Matter Hyperintensities

Purpose: Cerebral small vessel disease (SVD) is related to cardiovascular risk factors (CV) including hypertension, diabetes (DM), smoking, and advanced age which impact morbidity and mortality. Neuroimaging markers of SVD evident on MRI scans include white matter hyperintensities (WMH) of the periventricular (PWMH) and deep white matter (DWMH) regions and lacunar infarcts. While SVD evidenced by the presence of WMH is associated with cerebral atrophy, the relation between SVD and spinal cord (SC) atrophy has not been previously considered. The objectives of this study were to determine whether cross-sectional cervical SC area (SCA) on MRI is related to the presence of periventricular and deep WMH on brain imaging.

Methods: Patients age >30 years were identified who completed brain and cervical spine MRI studies within 3 months. Cervical SCA was measured from T2 weighted MRI images, the area of the SC measured at the middle of each vertebral body from C2-C6 and averaged. Brain MRI FLAIR images were assessed for the presence of PVWMH and DWMH and graded using the Fazekas scoring system. The bicaudate index is a measure of cerebral atrophy and is calculated as the intercaudate distance/skull distance.

Results: Demographic data was collected from 200 patients (age 60 -14 years; 67% female). On univariate analyses, mean SCA significantly correlated with age, DM, height, serum creatinine level, DWMH score, PVWMH score, and the bicaudate index. The PWMH score correlated with the DWMH. The bicaudate index correlated with both PVWMH and DWMH. On regression modeling using the univariate predictors, higher DWMH and PVWMH scores were independent predictors of lower mean SCA, as was the bicaudate index.

Conclusions: Lower SCA is associated with cerebral SVD evidenced by higher DWMH and PVWMH scores. SC atrophy is related to cerebral atrophy measured by the bicaudate index. The clinical implications of SC atrophy merit further study.