Subclinical Atherosclerosis and Cognitive Impairment: The XXXX Heart Study

Sunday, 10:45-10:55 AM
Location: N229

PARTICIPANTS:

Christopher Maroules MD (Presenter): Nothing to Disclose
Jarett Berry MD: Nothing to Disclose
Amit Khera MD, MSc: Nothing to Disclose
Heidi Rossetti PhD: Nothing to Disclose
Kirstine Carter PhD: Nothing to Disclose
Mohit K Gupta MD: Nothing to Disclose
Ronald M Peshock MD: Nothing to Disclose
Roderick McColl PhD: Nothing to Disclose
Colby Ayers MS: Nothing to Disclose
Nagina Malguria MBBS: Nothing to Disclose
Suhny Abbara MD: Research Consultant, Radiology Consulting Group
Kevin S King MD: Nothing to Disclose

CITE THIS ABSTRACT

PURPOSE

Limited studies have explored the relationship between atherosclerosis and cognitive impairment. We sought to determine associations between subclinical atherosclerosis, cognitive screening, and white matter hyperintensities on MRI, a predictor of cognitive function.

METHOD AND MATERIALS

The study consisted of 1903 participants from the XXXX Heart Study (mean age 44 ± 10 years, 56% female) without cardiovascular disease who underwent carotid and brain MRI at 3 Tesla. Semi-automated techniques were used to define wall contours of the internal and common carotid arteries (ICA and CCA) and white matter hyperintensity volume (WMH). Subjects also underwent Montreal Cognitive Assessment (MaCA) testing and multi-detector CT for measurement of coronary artery calcium (CAC) using the Agatston method. A MaCA score less than 26 was used to indicate the presence of at least mild cognitive impairment. Large WMH was defined as greater than 1 SD above the age-specific median. We related CAC and carotid wall areas to WMH and MaCA scores using Spearman correlation and multivariable linear and logistic regression models after adjusting for traditional risk factors, including age, ethnicity, male sex, diabetes mellitus, hypertension, smoking, and body mass index.

RESULTS

ICA and CCA wall areas correlated with WMH and MaCA score (all p<.001) in unadjusted models. After adjusting for traditional risk factors, ICA wall area remained associated with MaCA score (β = -0.02, p<.05), and CCA wall area remained associated with WMH (β = 0.002, p=0.04). Increasing ICA wall area predicted MaCA score <26 (OR 1.12 per 1 SD change, 95% CI 0.99-1.26, p=0.04) after multivariable adjustment, but increasing CCA wall area did not predict MoCA score <26 (p=0.5). After adjusting for traditional risk factors, CAC was associated with WMH (β = 0.013, p=0.0008). Increasing CAC score predicted large WMH (OR 1.19 per 1 SD change, 95% CI 1.11-1.27, p<.001) after multivariable adjustment.
CONCLUSION

Subclinical coronary and carotid atherosclerosis are predictors of poorer cognitive function as measured by MoCA score and white matter hyperintensity volume on MRI.

CLINICAL RELEVANCE/APPLICATION

Subclinical atherosclerosis may predict cognitive decline independent of traditional cardiovascular risk factors. Different sites and measures of atherosclerosis may have different sensitivities for predicting cognitive dysfunction.