P2-385 - Dementia and Stroke Risk Associated with Brain Artery Luminal Diameters

📅 Monday, July 17, 2023

🕐 1:45 AM - 9:15 AM

Theme

Biomarkers

Abstract

Background: It is unclear whether brain artery diameters measured on conventional T2-weighted brain MRI images relate to dementia and stroke outcomes across distinct populations. We aimed this study to evaluate the association of T2-weighted brain artery luminal diameters with dementia and stroke in three distinct population-based studies.

Methods: Three longitudinal population-based studies with 8420 adults >40 years old (Northern Manhattan Study [NOMAS] from the United States, and the Rotterdam Study [RS], from the Netherlands, and Three-City, from France) with brain MRI scans obtained between 1999 and 2015. The median follow-up time for clinical events ranged between 7 and 12.5 years. We tested our hypothesis in each cohort separately due to local data-sharing regulations. The exposure variable was brain carotid and basilar artery luminal diameters measured on MRI axial T2-weighted scans. Multivariable hazard ratios (HRs) and their 95% confidence intervals (CI) expressed the risk of dementia and stroke (primary outcomes) associated with the lowest (<5th) and highest (>95th) percentiles of the rank-normalized brain artery diameters compared to a reference group defined as the diameters distributed between the 5th and 95th percentiles. Secondary outcomes included total and vascular mortality, and fatal and nonfatal cardiovascular and coronary end points.

Results: Among the three cohorts (mean age ranged from 65 to 73 y, ≥57% women), 335 participants developed dementia and 331 strokes. Compared with the reference group, participants with arterial diameters >95th percentile had a higher risk of dementia (HR range 1.15-4.50) and any stroke (HR range 1.29-2.03). For secondary outcomes, participants with arterial diameters >95th percentile had a consistent higher risk of coronary outcomes, vascular mortality and a composite of any vascular events. The results were less supportive of a higher risk of events among participants with arterial diameters <5th percentile except for vascular mortality.

Conclusions: Individuals with dilated brain arteries are at higher risk of dementia and vascular events. Our findings were consistency across distinct populations in spite of using a non-enhanced, conventional T2-weighted MRI sequence. Understanding the underlying physiopathology of the reported associations, particularly with dementia and stroke, might reveal novel vascular contributions to dementia

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