

## SEVERITY OF INTRACRANIAL ARTERIAL CALCIFICATION ON CT AND FUTURE DEMENTIA: POPULATION-BASED STUDY AND SYSTEMATIC REVIEW

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**Background and Aims:** Coronary arterial calcification is a widely studied risk factor for acute coronary events, but although intracranial arterial calcification on CT-brain imaging (CT-IAC) is a frequent finding in older individuals, few longitudinal studies have assessed whether its presence, severity, or site predict cognitive impairment and dementia. Given the clinical and mechanistic importance of any associations, we did such a study and a systematic review.

**Methods:** In a nested case-control study of patients with minor stroke/TIA from the population-based Oxford Vascular Study (OXVASC), site and severity of CT-IAC (qualitatively and artery-specific volume) in cases who developed dementia on follow-up was compared with that in age/sex-matched controls who did not (logistic regression adjusted for other risk factors). Previous longitudinal studies, identified by systematic review, were pooled with OXVASC data using meta-analysis.

**Results:** In OXVASC (cases=200,controls=200; mean/SD age=78.0/9.3), internal carotid artery CT-IAC volume (top vs. bottom 50%) was independently associated with dementia risk (adjusted OR [aOR]=1.74, 95%CI=1.13-2.68,  $p=0.013$ ), particularly if bilateral (aOR=2.02, 1.26-3.24,  $p=0.003$ ), and remained so on pooling with the one published longitudinal study in patients with stroke/TIA (pooled aOR=1.71, 1.21-2.44,  $p=0.003$ ), and with a similar study in the general population (pooled aOR=1.88, 1.33-2.67,  $p<0.001$ ), with little overall heterogeneity ( $I^2=0$ ). Severity of vertebrobasilar CT-IAC also predicted dementia in OXVASC and in one previous study (pooled aOR=2.01, 1.06-3.82,  $p=0.032$ ).

**Conclusions:** Arterial calcification on routine CT-brain imaging is an independent predictor of future dementia after TIA/stroke. Effect-modifiers and dementia subtype associations should be determined in larger studies to identify mechanisms and potential treatments.