

Prevalence and anatomic characteristics of infarct-like lesions on MR images of middle-aged adults: The Atherosclerosis Risk in Communities Study

R. Nick Bryan, Jianwen Cai, Greg Burke, Richard G. Hutchinson, Duanping Liao, James F. Toole, Azar P. Dagher, and Lawton Cooper

Background and Purpose: MR imaging has revealed putative evidence of subclinical cerebrovascular disease (CVD) as reflected by white matter signal changes and infarct-like lesions (ILLs). Nonetheless, the prevalence of this condition in the general population has been defined only to a limited extent. We herein report the prevalence and anatomic characteristics of ILLs seen on cranial MR images obtained as part of a population-based study of cardiovascular disease in middle-aged adults. These results are contrasted to those of previous similar studies, particularly those of an elderly population in the Cardiovascular Health Study (CHS).

Methods: This Atherosclerosis Risk in Communities (ARIC) cohort consists of a probability sample of community-living persons who were 55 to 72 years old at the time of MR examination. MR imaging of 1890 participants was performed at two ARIC field centers, based on a common protocol. MR studies were evaluated by trained readers at the MR Reading Center using original digital data displayed on a high-resolution workstation. The measures of lesion size, anatomic location, and signal intensity were collected. The definition for an ILL was a non-mass, hyperintense region with an arterial vascular distribution on spin-density and T2-weighted images.

Results: Two hundred ninety participants had ILLs, for an overall prevalence of 15.3%. Eighty-two percent of participants with ILLs had lesions that were 3 mm or larger in maximal dimension, although 87% of these lesions were 20 mm or smaller in maximal dimension. The prevalence of ILLs increased with age, from 7.9% in the 55- to 59-year-old age group to 22.9% in the 65- to 72-year-old age group (P less than .001). Lesion prevalence was greater in black (20.7%) than in white persons (10.2% [P less than .0001]), but did not differ significantly between male and female participants. The basal ganglia and thalamic region was the most commonly affected anatomic site, accounting for 78.9% of the lesions.

Conclusion: Considering that the prevalence of self-reported stroke or transient ischemic attack in ARIC participants is 1.5%, these results suggest that there is significantly more subclinical than clinical CVD in the general population. Furthermore, the prevalence of this subclinical disease increases with age, and is greater in black persons. ILLs are dominated by "lacunae" in the basal ganglia and thalamus. These results are, in general, similar to those of a comparable study of elderly participants in the CHS, except for a 60% lower prevalence of ILLs in this younger population.