Subclinical and clinical cardiac diseases have been previously linked to magnetic resonance imaging (MRI) manifestations of cerebrovascular disease, such as lacunes and white matter hyperintensities, as well as dementia. Cortical cerebral microinfarcts (CMIs), a novel MRI marker of cerebral vascular disease, have not been studied, to date, in relation to subclinical and clinical cardiac diseases.

To examine the association of blood biomarkers of subclinical cardiac disease and clinically manifest cardiac diseases with CMIs graded on 3-T MRI in a memory clinic population.

This baseline cross-sectional analysis of a cohort study performed from August 12, 2010, to July 28, 2015, included 464 memory clinic participants. All participants underwent collection of blood samples, neuropsychological assessment, and 3-T MRI.

N-terminal pro–brain natriuretic peptide (NT-proBNP) and high-sensitivity cardiac troponin T (hs-cTnT) concentrations were measured by electrochemiluminescence immunoassays. Cardiac disease was defined as a history of atrial fibrillation, ischemic heart disease, or congestive heart failure.

The CMIs were graded according to a previously validated protocol.

Of 464 participants, 124 had insufficient blood plasma samples and 97 had no CMI grading (none, incomplete, or ungradable MRI), leaving a sample size of 243 for final analysis (mean [SD] age, 72.8 [9.1] years; 116 men [42.9%]). Seventy participants (28.8%) had cortical CMIs (median, 1; range, 0-43). Compared with participants with no CMIs, those with CMIs had a significantly higher prevalence of atrial fibrillation (rate ratio [RR], 1.62; 95% CI, 1.20-2.18), ischemic heart disease (RR, 4.31; 95% CI, 3.38-5.49), and congestive heart failure (RR, 2.05; 95% CI, 1.29-3.25). Significantly higher levels of NT-proBNP (RR, 3.16; 95% CI, 2.33-4.27) and hs-cTnT (RR, 2.17; 95% CI, 1.00-4.74) were found in participants with CMIs. In multivariate models adjusted for demographics and vascular risk factors, higher levels of NT-proBNP (RR, 3.19; 95% CI, 2.62-3.90) and hs-cTnT (RR, 4.86; 95% CI, 3.03-7.08) were associated with CMIs. These associations persisted even after excluding patients with clinically manifest cardiac disease.

This study found that biomarkers of subclinical cardiac disease and clinically manifest cardiac diseases were associated with CMIs on 3-T MRI in patients attending a memory clinic, suggesting that cardiac disease may contribute to the development of CMIs. Hence, cardiac dysfunction should be targeted as a potentially modifiable factor to prevent CMI-related brain injury.