Cardiovascular disease (CVD) remains a primary cause of mortality in the United States. It is a pervasive health problem that has tremendous psychosocial and economic cost.

Patients with CVD are at increased risk for stroke and other forms of cerebrovascular disease. Furthermore, there is significant overlap in the risk factors for both CVD and cerebrovascular disease. There is evidence that CVD can lead to insidious cerebrovascular changes that can lead to significant neurocognitive and functional changes, including vascular dementia.

Increasing evidence suggests that persons with CVD often experience neurocognitive impairment. CVD patients generally experience difficulty on task of executive function, psychomotor speed, and memory. Recent studies demonstrate that cognitive deficits vary as a function of CVD severity, with poorer health associated with the greatest impairment.

One possible explanation for this relationship that has not been examined is the possibility of changes in white matter integrity. Recent studies demonstrated fractional anisotropy (FA) measured using diffusion tensor imaging (DTI) is closely related to cognitive performance in persons with cerebrovascular disease.

The purpose of this study was to investigate the relationship between measures of FA, CVD severity, and cognition among a group of patients at increased risk for cerebrovascular disease.

Participants

Twelve patients (7 males and 5 females) were recruited from local medical centers and private practice with a history of cardiovascular disease. Patients were excluded who had any 1) neurological Disease, 2) chronic Intractable Psychiatric Disorder, 3) previous drug or alcohol abuse, 4) head injury (LOC>10 minutes), or 5) MRI Contraindications.

Patients demographics are included in Table 1 by gender. The Framingham Stroke Risk Profile (FSRP) was used as a measure of disease severity.

Patients were also administered a neuropsychological battery of tests across a wide range of domains. For this study, only the results for the similarities, block design, coding, and digit span subtests from the Wechsler Adult Intelligence Scale—third edition (WAIS-III) are presented.