

The impact of atrial fibrillation on cognitive function

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Abstract

Background and Aim: The connection between cardiovascular risk factors and cognitive impairment is well-established. Atrial fibrillation, the most prevalent arrhythmia in adults, is independently linked to dementia and an increased risk of cerebral infarctions. Atrial fibrillation can lead to dementia by shrinking gray matter volume, with inflammation playing a vital role in both the cause and effect of this condition. As systemic inflammation rises in atrial fibrillation, the likelihood of developing dementia also increases, posing a significant social and mental burden alongside Alzheimer's disease.

Methods: This study utilized PubMed and Science Direct databases to explore the connection between cognitive impairment and AF.

Results: Atrial fibrillation induces hypoperfusion by diminishing cardiac output, thereby instigating multiple strokes. Clinical evidence indicates that 5-10% of individuals afflicted with atrial fibrillation encounter cerebral infarctions, categorized into large and small types, with the former correlating with dementia while the latter remains independent of dementia. Moreover, the administration of warfarin in atrial fibrillation patients may impede cognitive functions by instigating microbleeds. Another ramification of atrial fibrillation is the progressive escalation of heart rate, leading to diminished cerebral blood circulation and an augmented stroke risk due to cerebral vascular dysregulation exacerbated by inflammation, which, in turn, exacerbates dementia. Atrial fibrillation contributes to elevated amyloid beta 42 levels through compromised brain tissue perfusion. Notably, atrial fibrillation predominantly enhances vascular dementia over the mixed type, although it incrementally impacts both types, with inflammatory elements perpetuating the adverse consequences. Atrial fibrillation's association with endothelial dysfunction paves the way for inflammatory agents to infiltrate the cerebrospinal fluid, while additionally reducing gray matter and hippocampal volumes. Cortical strokes predominantly stem from vascular pathologies, with certain infections like Helicobacter correlating with increased instances of atrial fibrillation and subsequent dementia.