

Changes in arterial stiffness, cognition and dementia risk in a diverse cohort

<https://neurodegenerationresearch.eu/survey/changes-in-arterial-stiffness-cognition-and-dementia-risk-in-a-diverse-cohort/>

Principal Investigators

HEISS, GERARDO

Institution

UNIV OF NORTH CAROLINA CHAPEL HILL

Contact information of lead PI

Country

USA

Title of project or programme

Changes in arterial stiffness, cognition and dementia risk in a diverse cohort

Source of funding information

NIH (NIA)

Total sum awarded (Euro)

€ 2,682,163.30

Start date of award

15/09/2016

Total duration of award in years

1

The project/programme is most relevant to:

Alzheimer's disease & other dementias

Keywords

Acquired Cognitive Impairment... Aging... Alzheimer's Disease... Alzheimer's Disease Related Dementias (ADRD)... Alzheimer's Disease including Alzheimer's Disease Related Dementias (AD/ADRD)... Basic Behavioral and Social Science... Behavioral and Social Science... Brain Disorders... Cardiovascular... Cerebrovascular... Clinical Research... Clinical Research - Extramural... Dementia... Minority Health for IC Use... Neurodegenerative... Neurosciences...

Research Abstract

Central arterial stiffness and increased blood flow pulsatility alter microvasculature structure and function in the brain contributing to hypoperfusion and end-organ damage. Repeated occurrences of microvascular ischemia reportedly lead to white matter hyperintensities, focal brain infarcts, and brain atrophy that contribute to cognitive impairment and the risk of mild cognitive impairment (MCI) and Alzheimer's disease-related dementias. While central artery stiffness is associated with impaired cognitive function and abnormalities on cerebral magnetic resonance imaging, no reports to date have examined the effect of changes in arterial stiffness and pulsatility on changes in brain structure, cognitive function, risk of MCI or dementia in community-dwelling older adults, nor have the important roles of gender and race in these associations been assessed. We propose to address these gaps in an ancillary study to the Atherosclerosis Risk in Communities – Neurocognitive Study (ARIC-NCS), an ongoing cohort study of well characterized individuals aged 70-89 years at baseline in 2011-2013, with repeat examinations to be conducted after 5 years in African American and white men and women. The 2016-2018 re-examination of 5,058 members of the ARIC-NCS cohort will include in-depth psychometric assessments, biologic and behavioral traits, and classification of MCI and dementia. This ancillary study will add repeat measures of arterial stiffness and pulsatility standardized to those measured in 2011-2013. Cohort members will thus be characterized on the rate of change in central arterial stiffness and pulsatility over the course of 5 years and the modifiable determinants of their temporal change. Associations will be quantified between these changes in central arterial stiffness and pulsatility with changes in white matter hyperintensities, incident focal cerebral infarcts, domain-specific cognitive function, and 5-year incidence of MCI and dementia. Associations are hypothesized to be stronger among those with MCI at baseline, among women, and among African Americans. This cost-efficient ancillary study in response to PAR-15-356 will contribute novel, prospective information to the limited knowledge base on the effects of central arterial stiffness and pulsatility on brain structure and function in older adults, and for the first time address these questions in a large sample of African Americans, a population burdened with greater arterial stiffness, MCI and dementia in older age. Accumulating evidence on the ability to modify arterial stiffness and pulsatility through changes in lifestyle and by targeted blood pressure control adds significance to these questions toward efforts to reduce the population burden of MCI and dementia, and in the promotion of cognitive resilience in our aging population.

Lay Summary

We propose to examine the impact of 5-year changes in stiffening of the arteries and blood pressure pulsatility on 5-year changes in damage to small vessels in the brain, cognitive performance, and the development of mild cognitive impairment and Alzheimer's associated dementias in members of the Atherosclerosis Risk in Communities – Neurocognitive Study (ARIC-NCS) study, a biracial cohort of men and women aged 70-89 years when last examined in 2011-2013. The potential impact of the proposed study stems from the new information it contributes on age-related vascular changes as modifiable risk factors for cerebral microvascular damage, cognitive function, and dementia. Adding to this study's significance is the ability to examine the contribution of arterial stiffness and blood pressure pulsatility to the burden of cerebral impairment in African Americans, and to examine differences by sex.

Further information available at:

Types:

Investments > €500k

Member States:

United States of America

Diseases:

Alzheimer's disease & other dementias

Years:

2016

Database Categories:

N/A

Database Tags:

N/A