

Diabetes Status and Brain Amyloid in Middle Aged Hispanics

<https://www.neurodegenerationresearch.eu/survey/diabetes-status-and-brain-amyloid-in-middle-aged-hispanics/>

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Country

USA

Title of project or programme

Diabetes Status and Brain Amyloid in Middle Aged Hispanics

Source of funding information

NIH (NIA)

Total sum awarded (Euro)

€ 5,084,326.61

Start date of award

01/09/2015

Total duration of award in years

2

The project/programme is most relevant to:

Alzheimer's disease & other dementias

Keywords

Acquired Cognitive Impairment... Aging... Alzheimer's Disease... Alzheimer's Disease including Alzheimer's Disease Related Dementias (AD/ADRD)... Brain Disorders... Cerebrovascular... Clinical Research... Clinical Research - Extramural... Dementia... Diabetes... Diagnostic Radiology... Endocrine System... Minority Health for IC Use... Neurodegenerative... Neurosciences

Research Abstract

? DESCRIPTION (provided by applicant): This proposal is being submitted in response to PA-13-302 "Research Project Grant (Parent R01)." The name of this proposal is Diabetes Status and Brain Amyloid in Middle Aged Hispanics. The main goal of this proposal is to study whether diabetes status (type 2 diabetes [referred to as diabetes] and pre-diabetes, compared with normal glucose tolerance [NGT]), is related to increased amyloid β ($A\beta$) deposition in the brain, one of the culprits of Alzheimer's disease (AD), in a community sample of 150 middle aged Hispanics with a mean age of 63 years. We will also explore whether brain $A\beta$ mediates the association between diabetes status and memory impairment, the main early clinical manifestation of AD, and whether brain $A\beta$ and cerebrovascular disease interact to cause memory impairment. Many studies have reported an association of diabetes with a higher risk of amnesic mild cognitive impairment (MCI) and late onset Alzheimer's dementia (LOAD), clinical manifestations of AD. The few autopsy studies that have explored whether diabetes is related to AD pathology have had conflicting results. Thus, it is not clear whether diabetes causes AD pathology. The limitations of existing studies that preclude further advance in this field include survival and selection bias related to diabetes in elderly samples, lack of concurrent measures of diabetes and cognition in middle aged cohorts, and lack of longitudinal ascertainment of diabetes and pre-diabetes. We propose to overcome these limitations and advance the field by continuing longitudinal assessments of a cohort of middle aged Hispanics with concurrent assessment of cognition and diabetes status (by history and Hemoglobin A1c [HbA1c]), by assessing the presence of brain $A\beta$ in-vivo using 18F-florbetapir positron emission tomography (PET), and assessing the presence of cerebrovascular disease (infarcts and white matter hyperintensities [WHI]) using brain magnetic resonance imaging (MRI) in a 5-year project. Our primary hypothesis is that diabetes and pre-diabetes are related to accumulation of brain $A\beta$ as compared to persons with NGT. Our secondary hypotheses are that brain accumulation of $A\beta$ mediates the association of diabetes and pre-diabetes with worse memory impairment, and that the presence of brain infarcts and white matter disease increases the risk of memory impairment in the presence of $A\beta$. Our primary aim is to compare the presence of whole brain fibrillar $A\beta$ measured with 18F-florbetapir PET cross-sectionally and longitudinally (with an interval of 2 years) between participants with diabetes (n=50), pre-diabetes (n=50), and NGT (n = 50). We will also examine the association of glycemia as continuous exposure, using HbA1c, with whole brain fibrillar $A\beta$. Our secondary aims are: 1) To explore whether differences in whole brain fibrillar $A\beta$ measured with 18F-florbetapir PET among participants with diabetes, pre-diabetes, and NGT, mediates the association of diabetes and pre-diabetes with worse memory performance; 2) To explore if the presence of cerebrovascular disease (infarcts and WHI) moderates the mediation of $A\beta$ in the association of diabetes and pre-diabetes with memory impairment.

Lay Summary

PUBLIC HEALTH RELEVANCE: Our project addresses priorities of the National Institute on Aging and the National Alzheimer Project Act. Our study has the potential to answer whether brain Amyloid β accumulation, a culprit of Alzheimer's disease, is higher in persons with diabetes and pre-diabetes, conditions that affect the majority of our community-based Hispanic cohort, a third of adults in the United States, and half of adults over 60 years, who are most susceptible to Alzheimer's disease and cognitive impairment. Thus, our project is of high public health significance and potential high impact.

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