The VETSA Longitudinal MRI Twin Study of Aging

https://www.neurodegenerationresearch.eu/survey/the-vetsa-longitudinal-mri-twin-study-of-aging/

Principal Investigators

KREMEN, WILLIAM S.

Institution

UNIVERSITY OF CALIFORNIA SAN DIEGO

Contact information of lead PI
Country

USA

Title of project or programme

The VETSA Longitudinal MRI Twin Study of Aging

Source of funding information

NIH (NIA)

Total sum awarded (Euro)

€ 10,072,879.82

Start date of award

15/09/2003

Total duration of award in years

13

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)... Behavioral and Social Science... Brain Disorders... Clinical Research... Clinical Research - Extramural... Dementia... Diagnostic Radiology... Epidemiology And Longitudinal Studies... Genetics... Human Genome... Neurodegenerative... Neurosciences... Prevention

Research Abstract

? DESCRIPTION (provided by applicant): Although in recent years there has been an urgent appeal for earlier identification of people at risk for cognitive decline and dementia, middle age and the transition from middle- to early-old-age are still relatively under- studied and not well understood. Yet this critical transition period needs to be the focus of study in order to gain insights into what foreshadows good or poor outcomes. Our primary goal is a better understanding of the genetic and environmental underpinnings of cognitive and brain aging during this period with an eye toward continued follow-up into later old age. To accomplish that goal it is advantageous to prospectively follow a large, genetically-informative sample beginning in a narrow midlife age band. We began the Vietnam Era Twin Study of Aging (VETSA) when participants were average age 55 (51-60) and we conducted a follow-up at average age 61. The proposed study is a third wave of multi-modal neuroimaging at average age 66. We will address genetic, and environmental factors that influence change. Aim 1 is to extend the VETSA MRI database-one the largest MRI studies beginning in middle age-to include the third timepoint along with all VETSA cognitive, biomedical, and psychosocial data, and make it publicly available after study completion. We anticipate an ~80% return rate. Aim 2 is to prospectively characterize the heterogeneity of midlife to early- old-age cognitive and brain aging trajectories. Wide age range studies characterize ages 50-60 as a point of inflection when the slope of brain tissue shrinkage or ventricular enlargement increases, but they can only capture average trends. We hypothesize considerable variation in timing of inflection points and in rates of change across brain regions. Some key factors that we will examine are cognitive reserve, early identification of MCI, and interactive effects of APOE genotype. With new longitudinal trajectory data, we will also compare our different operational definitions of MCI when subjects were only in their 50s, to determine those most predictive of stability of MCI or decline. Aim 3 is to examine influences of biomedical, psychosocial, and personality factors on brain and cognitive aging. Some key foci are cardiometabolic factors and responses to stress. We will now have genome-wide genotyping data (at no cost to this project). As such, all of our twin models will now incorporate polygenic risk/propensity scores (PRSs) validated in large external genome-wide association studies, so that we can determine total genetic variance based on measured genetic variance plus remaining latent genetic variance. We will also use novel gene enrichment and genetic-pleiotropy- informed methods developed by members of our team in order to boost the power of those PRSs. This longitudinal, community-based MRI twin study with 3 time points will generate an unprecedented wealth of information during this important aging period that will be a resource for future investigations. The study results can have profound public health impact as early identification improves prospects for intervention that could substantially reduce the number of dementia cases and improve later functioning and quality of life.

Lay Summary

PUBLIC HEALTH RELEVANCE: It has become increasingly recognized that the key to reducing cognitive decline and dementia and promoting healthy aging is early identification of risk/protective factors, but the midlife to early old age transition is still not well understood. he primary goal of this study is to increase understanding of the genetic and environmental factors that predict different cognitive and brain aging trajectories during this period. Information to be gained has the potential for enormous public health impact in reducing burden and improving quality of later life.

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