Noninvasive Stimulation to Improve Hippocampal-Dependent Memory in Older Adults

https://neurodegenerationresearch.eu/survey/noninvasive-stimulation-to-improve-hippocampal-dependent-memory-in-older-adults/

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Country

USA

Title of project or programme

Noninvasive Stimulation to Improve Hippocampal-Dependent Memory in Older Adults

Source of funding information

NIH (NIA)

Total sum awarded (Euro)

€ 2,102,853.21

Start date of award

15/06/2015

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)... Behavioral and Social Science... Brain Disorders... Clinical Research... Clinical Research - Extramural... Dementia...

Research Abstract

DESCRIPTION (provided by applicant): Memory impairment is a major challenge for healthy older adults as well as those with age-related neurodegenerative diseases such as Alzheimer's disease and Mild Cognitive Impairment (MCI). Unfortunately there are no current treatments that reliably and robustly improve memory abilities for older adults. The goal of this project is to better understand and to improve a new potential treatment for memory impairment developed by the investigative team. This procedure involves noninvasive stimulation of the hippocampal brain network necessary for memory, and is called ""Hipp-Stim."" We have previously shown that Hipp-Stim can produce robust and lasting enhancement of the hippocampal network and associative (hippocampal-dependent) memory in young healthy individuals. The current proposal is to test efficacy and mechanisms of action in healthy elderly adults and in MCI patients. The effects of stimulation will be observed on tests of hippocampal- dependent memory and on brain imaging measures of hippocampal network function obtained in relation to memory capabilities. Sham-controlled, double-blind experiment designs will be used to ensure that treatment effects are specific to stimulation. Furthermore, comprehensive cognitive assessments will test selectivity of stimulation effects to memory, and neuroimaging analyses will test selectivity of stimulation effects to hippocampal brain networks. Improvements in memory performance will be assessed in relation to changes in individual's ability to perform and satisfaction with activities of daily living, in order to identify ramifications of improved memory for life quality. By performing Hipp-Stim experiments using a variety of hypothesis-driven stimulation intensities, frequencies, and delivery locations, we will determine optimal parameters for producing the greatest positive effects on memory ability, hippocampal network function, and life quality. A group of individuals with MCI will receive treatment using the optima stimulation parameters in order to determine if Hipp-Stim is effective for this condition. All experiments involve sophisticated assessments of hippocampal- dependent memory performance and hippocampal brain network function. The findings will thus deeply inform knowledge of stimulation effects and therefore foster better understanding of relevant mechanisms of action on memory-related brain regions in older adults. Insights from this research could propel understanding of age- related memory impairment and its treatment by noninvasive stimulation, while also producing new methods to combat age-related and neurodegenerative loss of memory abilities.

Lay Summary

PUBLIC HEALTH RELEVANCE: Aging and age-related neurodegenerative disorders such as Alzheimer's disease have negative consequences for long-term memory abilities, causing substantial burdens for individuals, families, health-care systems, and society. This project seeks to better understand and refine a new potential treatment for age-related memory impairment involving noninvasive stimulation of the hippocampal brain network, a collection of structures necessary for long-term memory. Findings will be directly relevant to the understanding and treatment of memory disorders in aging and neurodegenerative conditions.

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