

Augmenting Cognitive Training in Older Adults – The ACT Grant

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Country

USA

Title of project or programme

Augmenting Cognitive Training in Older Adults - The ACT Grant

Source of funding information

NIH (NIA)

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Start date of award

01/09/2016

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 including Alzheimer's Disease Related Dementias (AD/ADRD)... Behavioral and Social Science... Brain Disorders... Clinical Research... Clinical Research - Extramural... Clinical Trials and Supportive Activities... Dementia... Diagnostic Radiology... Neurodegenerative... Neurosciences... Prevention... Rehabilitation... Translational Research

Research Abstract

ABSTRACT: This randomized clinical trial will test whether transcranial direct current stimulation (tDCS) of frontal cortices enhances neurocognitive and functional outcomes achieved from cognitive training in older adults experiencing age-related cognitive decline. Change in well-validated measures of neurocognitive function and everyday abilities will serve as outcome measures. Functional and structural neuroimaging biomarkers of neural plasticity and learning (fMRI, GABA MRS, etc.) will measure intervention-associated alterations in specific brain regions impacted by cognitive aging. tDCS is a noninvasive brain stimulation method that facilitates neural plasticity and learning. Accordingly, when used as an adjunctive intervention, tDCS may augment cognitive training effects. This study will leverage existing multisite clinical trial infrastructure at McKnight Brain Institutes located in two of the states with the largest representation of older adults in the United States: University of Florida, University of Miami, and University of Arizona. Adults over the age of 65 represent the fastest growing group in the US population. As such, age-related cognitive decline represents a major concern for public health. Recent research suggests that cognitive training in older adults can improve cognitive performance, with effects lasting up to 10 years. However, effects are typically limited to the tasks trained, with little transfer to other cognitive abilities or everyday skills. Effects may also be reduced in people with Alzheimer's disease risk factors. A two-phase multisite randomized clinical trial will examine the individual and combined impact of pairing cognitive training with transcranial direct current stimulation (tDCS) in older adults experiencing age-related cognitive decline (n = 360; 120 per site). Participants will consist of elderly men and women 65-90 years of age with evidence of age-related cognitive decline, but not MCI or Alzheimer's disease (MoCA²⁵). We will compare changes in cognitive and brain function resulting from CT and CT combined with tDCS using a comprehensive neurocognitive, clinical, and multimodal neuroimaging assessment of brain structure, function, and metabolic state. Functional magnetic resonance imaging (fMRI) will be used to assess brain response during working memory, attention, and memory encoding; the active cognitive abilities trained by CT. Proton magnetic resonance spectroscopy (MRS) will assess markers of neural plasticity, GABA concentrations, and cerebral metabolism. We hypothesize that: 1) tDCS will enhance neurocognitive function, brain function, and functional outcomes from CT; 2) Effects of tDCS on CT will be maintained up to 12 months following training, and 3) Neuroimaging biomarkers of cerebral metabolism, neural plasticity (GABA concentrations) and functional brain response (fMRI) during resting vs. active cognitive tasks will predict individual response to tDCS, with certain Alzheimer's risk factors (e.g., APOE4 genotype, family history of Alzheimer's disease) predicting poorer cognitive and functional outcome. To date, no studies have comprehensively examined combined CT and tDCS intervention in the elderly. This study will provide definitive insight into the value of combating cognitive decline in a rapidly aging US population using tDCS with cognitive training.

Lay Summary

Narrative This randomized clinical trial examines the effect of augmenting cognitive training with transcranial direct current stimulation to maximize cognitive and functional outcomes older adults experiencing age-related cognitive decline. Change in well-validated measures of everyday abilities and neurocognitive function will serve as outcome measures. Functional and structural neuroimaging biomarkers of neural plasticity and learning (fMRI, GABA MRS, etc.) will measure intervention-associated alterations in specific brain regions impacted by cognitive aging.

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:

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