

Vitamins D and K and Neuropathologically-Defined Alzheimer and Other Dementias in Older Persons

<https://neurodegenerationresearch.eu/survey/vitamins-d-and-k-and-neuropathologically-defined-alzheimer-and-other-dementias-in-older-persons/>

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Contact information of lead PI Country

USA

Title of project or programme

Vitamins D and K and Neuropathologically-Defined Alzheimer and Other Dementias in Older Persons

Source of funding information

NIH (NIA)

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€ 3,350,074.31

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01/09/2016

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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)... Brain Disorders... Clinical Research...

Research Abstract

PROJECT SUMMARY Identification of dietary factors that delay decline in cognitive function has important implications for reducing the burden of Alzheimer's dementia (AD) and reducing health care costs as the population ages. Inadequate intakes of vitamins D and vitamin K are common among the elderly, and both these nutrients increase risk of cognitive impairment when fed in low amounts in animal models. However, there is a fundamental gap in knowledge about the forms of vitamins D and K present in the human brain or how these individual forms are linked to AD neuropathology and biomarkers of nutrient status. In the absence of that knowledge, design of clinical trials to test therapeutic roles of vitamins D and/or K in reducing AD burden is premature. The overall goal of the proposed research is to study the associations between vitamins D and K and AD neuropathology in older persons with and without cognitive impairment from a well-characterized community-based study. Guided by strong preliminary data, this objective will be accomplished by pursuing three specific aims leveraging the Memory and Aging Project (MAP), a clinical-pathologic prospective epidemiologic cohort study: Specific Aim 1: To identify the forms and levels of vitamin D and vitamin K and their metabolites in human brain tissue collected from two neocortical regions associated with AD risk and one region unrelated to AD risk from up to 500 deceased MAP participants, and to relate these nutrient levels to markers of brain neuropathology and to cognitive decline; Specific Aim 2: To measure vitamin D and vitamin K and their metabolites in serum samples collected in a subset of 170 MAP participants over two time points to determine if these serum levels predict cognitive decline, as well as predict brain levels of vitamins D and K.; and Specific Aim 3: Determine dietary contributors, including diet patterns and individual vitamin intakes, to brain and serum vitamin D and vitamin K levels and cognitive decline in MAP participants. The proposed approach is innovative because it builds on animal models to determine whether vitamins D and K in the human brain relate to neuropathologically-defined AD. Furthermore, the proposed research will determine whether dietary intakes and serum levels of these nutrients reflect corresponding levels in the brain. A recent meta-analysis indicated that there is an immediate need for human studies, such as the one proposed here, to determine the significance of the association between biomarkers of nutrient status and AD risk. Thus the proposed research is significant because these two nutrients, which are generally consumed below recommended intakes for older persons, are modifiable, low-cost, yet safe when consumed in higher amounts. Successful completion of the proposed study will provide the first data on vitamins D and K in human brain tissue, and will provide the foundation for future studies on the impact of modifying vitamin D and/or vitamin K on AD risk.

Lay Summary

PROJECT NARRATIVE The proposed research is relevant to public health and NIA's mission for the division of neuroscience as understanding vitamin D and K's role in Alzheimer's disease and related dementias of aging offers a potentially important, novel, and low-cost intervention for populations at higher risk for dementia. A thorough analysis of this relationship will ultimately allow researchers to clarify the forms of vitamin D and vitamin K important to neuropathologically-defined dementia and justify the conduct of future vitamin D and K supplementation trials.

Further information available at:

Types:

Investments > €500k

Member States:

United States of America

Diseases:

Alzheimer's disease & other dementias

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