

Virtual Reality based Spatial Memory Intervention for patients with Mild Cognitive Impairment

<https://neurodegenerationresearch.eu/survey/virtual-reality-based-spatial-memory-intervention-for-patients-with-mild-cognitive-impairment/>

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Country

Canada

Title of project or programme

Virtual Reality based Spatial Memory Intervention for patients with Mild Cognitive Impairment

Source of funding information

CIHR

Total sum awarded (Euro)

€ 512,786

Start date of award

01/10/2012

Total duration of award in years

4.0

The project/programme is most relevant to:

Alzheimer's disease and other dementias

Keywords

anatomy| fmri| hippocampus| spatial memory| vbm| virtual navigation

Research Abstract

Lay Summary

Mild Cognitive Impairment (MCI) is an intermediate stage between normal aging and Alzheimer's disease (AD). AD causes degeneration in the hippocampus (HPC) and this has been linked to memory loss. We propose to test patients with MCI and healthy controls on a computer training program specifically aimed at stimulating the hippocampus, in order to help alleviate the memory loss caused by AD. We previously developed a virtual task to test the ability to find objects in the environment. The caudate nucleus (CN) and hippocampus are brain regions involved in this ability. We found that the participants who used environmental landmarks (such as trees and buildings) a strategy we call "spatial learning", involved activity in the hippocampus. The other participants used a strategy called "response learning" which relies on the CN. This strategy involves learning a route by performing a sequence of movements repeatedly (turn right at the end of the road). We found that people using spatial learning have more grey matter in the HPC than people using response learning. Since the HPC is affected by AD, we developed a spatial memory training program for MCI patients in order to try and stimulate this region. Participants will undergo a 2 month program of two 60-minute sessions per week totaling 16 hours of spatial memory training over 8 weeks. We will test 143 MCI patients and healthy elderly over four years. Only half of them will go through the training program. The other half will act as controls and will be engaged in other stimulating activities that do not involve spatial memory in order to discriminate changes due to the spatial memory intervention program from non-specific changes associated with training at our research laboratory. If successful, this program will lead to better navigational skills, greater functional autonomy and better quality of life in patients and healthy participants.

Further information available at:

Types:

N/A

Member States:

Canada

Diseases:

Alzheimer's disease & other dementias

Years:

2016

Database Categories:

N/A

Database Tags:

N/A