Age and performance: the relation between brain structure and cognition -Part II

Published: 21-05-2019 Last updated: 09-04-2024

Main objectives: To determine the changes in structural and functional measures over a twoyear time period in healthy elderly volunteers, and to determine the association between structural and functional changes.Secondary objectives: Magnitude of...

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Observational non invasive

Summary

ID

NL-OMON48809

Source ToetsingOnline

Brief title Age and performance * Part II

Condition

• Other condition

Synonym

n.v.t.

Health condition

geen aandoening

Research involving

Human

Sponsors and support

Primary sponsor: Rijksuniversiteit Groningen Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: cognitie, hersenstructuur, MRI, veroudering

Outcome measures

Primary outcome

Cognitive measures: Number of words remembered (15 word test), variable representing the Simon effect for inhibition (Simon task), completion time (TMT).

Imaging measures as derived from MRI scans: Whole brain grey matter volume, cortical thickness in the superior frontal gyrus, FA of the prefrontal cortex

Secondary outcome

Main study parameters of cognitive performance consist of the default outcome measures of each cognitive task. Regarding the MRI scans we derive volumetric data of grey matter, white matter and cerebral spinal fluid,(mean) cortical thickness, percentage of white matter hyperintensities in relation to brain volume, and DTI scalar values (FA, MD, AD and RD). Standardized change scores of these measures will be calculated.Further more information on reduction of working hours and possible retirement will be taken into consideration.

Study description

Background summary

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In general ageing is related to changes in cognition and brain structures. The majority of studies examining the effects of age on brain and cognition have used cross-sectional designs, that is, comparing groups of young- and older adults in order to examine the effects of age. This however has it*s downsides as there are large individual differences in both brain structures and cognitive functioning (group heterogeneity), which are not taken into account. The present study therefore aims at gaining a broad picture of age-related changes in brain structure and cognitive functioning in a group of older adults by using a longitudinal within-subjects design. Allowing for a more detailed insight into the temporal dynamics of the ageing process. In our previous study (*Age and performance: the relation between brain structure and cognition*) we controlled for retirement as a possible cause of individual variation in the older adults. However, the period of transition into retirement offers a unique time window that allows to study adaption and coping over a period characterized by substantial everyday-life changes that may affect overall brain and cognition. Structural and functional changes over time will therefore also be associated to major life events, such as reduction in working time and retirement.

Study objective

Main objectives: To determine the changes in structural and functional measures over a two-year time period in healthy elderly volunteers, and to determine the association between structural and functional changes.

Secondary objectives: Magnitude of changes in structural and functional measures will be inspected and associated to major life events, such as reduction in working time and retirement.

Study design

The study will follow the same setup as executed in the study 'Age and performance: the relation between brain structure and cognition', which will function as the first measurement, in order to be able to compare the outcome measures.

Data wil be collected on two seperate days. On day 1 participants perform the cognitive tasks and on day 2 MRI data will be collected. Additionally participants fill out a set of questionnaires at home beforehand.

During day 1, participants will perform a broad range of cognitive tasks: 1) reaction time task; 2) selective and dived attention task; 3) inhibition task; 4) visual observational ability task; 5) working memory task; 6) semantic and phonetic fluency tests; 7) 15 words test (verbal memory); 8) trial making test (i.a. conceptual tracking ability); 9) Dutch reading test for adults (crystallized intelligence); 10) WAIS matrices (fluid intelligence); 11) Clock

test (mental imagery manipulation), 12) Montreal Cognitive Assessment, and 13) a driving simulator task.

During day 2 MRI data will be collected using a 3 Tesla Siemens MRI scanner. The MRI protocol consists of a T1-weighted and a T2-FLAIR weighted scan and a DWI scan. During scanning the participant is asked to lie as still as possible and to relax as no specific task has to be exerted during scanning.

Participants will be fully informed about the nature and para meters of the study and paradigm before the experimental sessions and after the second session they will be fully debriefed.

Study burden and risks

In the MRI-scanner participants will be exposed to a field-strength of 3 Tesla and scanner noise. Thus far ther is no evidence to suggest that exposing humans to a magnetic field of this strength has a negative influence on health. Ear protection will be provided to protect hearing from the noise. Participants will not benefit directly from participating in the study, however the data collected during this study will enhance our understanding of the relationship between structural brain differences and cognitive performance in ageing.

Contacts

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Trial sites

Listed location countries

Netherlands

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Eligibility criteria

Age

Adults (18-64 years) Elderly (65 years and older)

Inclusion criteria

- Having participated in the study *Age and performance: the relation between brain structure and cognition*.

- Right-handed

- Normal (or corrected to normal) vision

Exclusion criteria

- Not matching the inclusion criteria
- MR incompatible (possibility of any incompatible metal objects inside the body)

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Other

Recruitment

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NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	26-06-2019
Enrollment:	37
Туре:	Actual

Ethics review

Approved WMO	
Date:	21-05-2019
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register CCMO Other ID NL66825.042.19 NL7637