Neuroplasticitiy in homonymous hemianopia: structural brain changes underlying residual and compensatory perceptual behaviour

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Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Structural brain disorders
Study type	Observational non invasive

Summary

ID

NL-OMON47305

Source
ToetsingOnline

Brief title
Neuroplasticity in homonymous hemianopia

Condition

- Structural brain disorders

Synonym
"one sided visual field loss", homonymous hemianopia

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Groningen

Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: Compensatory perceptual behaviour, Homonymous hemianopia, Neuroimaging, Neuroplasticity

Outcome measures

Primary outcome

Our main primary outcome parameters are:

* Ophthalmic functioning/condition (assessed by ophthalmic examination)

* Contrast values of grey and white matter volumes

* Water diffusion in brain tissue expressed in fractional anisotropy (FA),

* Retinal nerve fibre layer thickness

Secondary outcome

Our secondary study parameters, derived from our primary study parameters, are:

* Visual Field maps

* Cortical thickness maps

* Course of white matter tracts

* Retinal nerve fibre degeneration

* Myelin content

Study description

Background summary

Our present knowledge of the adaptive capacity of the brain following homonymous hemianopia (HH), a visual field defect due to pathology along the visual system, is incomplete and largely qualitative in nature. Most studies on HH have focussed on the behavioural and psychophysical aspects of the condition, whilst quantitative research on cortical plasticity following the

condition is lacking. In particular, we have very limited understanding of how changes in visual processing are reflected in sustained structural cortical changes. Therefore, we aim to study a group of (post-chiasmatic brain injured) participants with HH to quantitatively assess the cortical reorganisation in this population. We hypothesise that changes in visual in HH are reflected in structural changes in the visual system (i.e. cortical thickness and white matter tracts), and changes in structural connectivity maps.

Study objective

Our objective is to get insight into whether and how the visual system reorganises after acquiring HH. Visual processing will be investigated and cortical reorganisation at a structural level will be examined. For this purpose, we will assess cortical plasticity by MRI. In this way, we will investigate the impact of homonymous visual field defects on perceptual processing and correlate it to structural cortical plasticity.

Study design

The study will be an observational study; a cross-sectional case-control design with participants with HH and controls matched for age and gender. The study consists of three parts: 1) a functional questionnaire (only patients), 2) physiological measurements, and 3) an MRI experiment.

Study burden and risks

There are no risks associated with this study. Participants will be exposed to standard clinical tests and a magnetic resonance imaging (MRI) experiment with a magnetic field of 3 Tesla and fast fluctuating magnetic gradients and radio-frequency fields. These field strengths are common in MRI research. Up till now no side effects have been reported and hemianopia has been studied with MRI before without any side effects. In rare cases an abdominal peripheral nerve could possibly be stimulated because of the fluctuating magnetic fields. This results in a tickling, but harmless, feeling.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

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

Inclusion criteria

Participants with hemianopia:
- have signed written consent
- age older than 18
- homonymous hemianopia due to post chiasmic brain injury
- stable ophthalmologic conditions;Controls:
- have signed written consent
- age older than 18
- subjectively healthy

Exclusion criteria

Participants with hemianopia:
- clinical eye conditions
- auditory impairments;Controls:
- visual impairments
- auditory impairments

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Allocation:	Non-randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Basic science

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	22-05-2018
Enrollment:	40
Type:	Actual

Ethics review

Approved WMO Date:	14-06-2016
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)
Approved WMO Date:	08-02-2019
Application type:	Amendment
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

ID: 21100
Source: Nationaal Trial Register
Title:

In other registers

Register	ID
Other	5752
CCMO	NL55973.042.15
OMON	NL-OMON21100