Brain changes as a consequence of blindness in one half of the visual field

No registrations found.

Ethical review	Not applicable
Status	Pending
Health condition type	-
Study type	Observational non invasive

Summary

ID

NL-OMON21100

Source
Nationaal Trial Register

Brief title
Neuroplasticity in homonymous hemianopia

Health condition

Homonymous hemianopia, post chiasmic cardiovascular accident

Homonieme hemianopsia, post-chiasmatische beroerte

Sponsors and support

Primary sponsor: Prof. dr. N.M. Jansonius
UMCG, Department of Ophthalmology
HPC BB61, Postbus 30.001 9700 RB Groningen
Source(s) of monetary or material Support: BCN-BRAIN, University Medical Center Groningen

Intervention

Outcome measures

Primary outcome

scores on visual and auditory functional tests, cortical activation and functional connectivity during visual and auditory processing, cortical and retinal nerve thickness and white matter tracts of all individual participants.

Secondary outcome

visual evoked potentials, outcomes of a standard questionnaire (to determine in-/exclusion), eye-tracking movements during visual tasks.

Study description

Background summary

Even though there is increasing interest in the reorganisation of the brain after vision loss, systemic investigation of neuroplasticity in patients with homonymous hemianopia (HH), the complete loss of one side of the visual field, is still very rare. Better understanding of this unchartered field has tremendous potential for the development or neuroscientifically-motivated rehabilitation techniques. For that reason and with this project, I want to get insight into whether and how both the visual and the auditory system reorganise after acquiring HH. More specifically, I want to investigate adaptive auditory and visual processing (optimised residual and risen compensatory perceptual performance) of patients with HH and I expect this to be reflected in cortical reorganisation at both a structural and a functional level. For this purpose psychophysical tests will be performed and cortical plasticity will be assed by (f)MRI using a combination of a novel techniques (i.e. population receptive field modelling, connective field mapping and cortical thickness comparisons). In this way, the impact of homonymous visual field defects on perceptual processing can be investigated and, subsequently, the degree of optimised residual and compensatory perceptual behaviour can be correlated with structural and functional cortical plasticity. This provides us with new quantitative knowledge about changes in cortical structure, visual and auditory networks and maps in HH close to the level of neuronal populations – the level that is most critical for understanding the relationship between neural computations, behaviour and perception, which could eventually lead to systematic training tools that will improve the reorganisation.

Study objective

We expect to find adaptive auditory and visual processing (optimised residual and risen compensatory perceptual performance) as a consequence of homonymous hemianopia. Additionally, we hypothesise these changes to be reflected in sustained functional and structural changes on the cortical level. More specifically, we expect a) remapped visual field representations in the visual cortex, b) structural changes in the visual system (i.e. cortical thickness and white matter tracts), c) changes in cortical representations of auditory space, and d) changes in functional connectivity maps.

Study design

not applicable, no longitudinal design

Intervention

auditory and visual functioning tests
(f)MRI measurements

Contacts

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Eligibility criteria

Inclusion criteria

Participants with hemianopia:

- have signed written consent

- age older than 18

- homonymous hemianopia due to post chiasmic CVA stable ophthalmologic conditions

Controls:

- have signed written consent age older than 18

- subjectively healthy

Exclusion criteria

Participants with hemianopia:

- visual neglect

- visual field defect due to condition other than post chiasmic CVA clinical eye conditions

- hearing impairments

- macular sparing

Controls:

- visual impairments

- auditory impairments

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Masking:	Open (masking not used)
Control:	N/A , unknown

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	01-03-2016
Enrollment:	40

Type: Anticipated

Ethics review

Not applicable
Application type: Not applicable

Study registrations

Followed up by the following (possibly more current) registration

ID: 47305
Bron: ToetsingOnline
Titel:

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

No registrations found.

In other registers

Register	ID
NTR-new	NL5637
NTR-old	NTR5752
CCMO	NL55973.042.15
OMON	NL-OMON47305

Study results

Summary results
not applicable