Motion perception in glaucoma: detecting oscillatory motion with foveal vision

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The main objective is to compare motion perception thresholds in glaucoma patients with healthy subjects as a function of oscillation frequency and luminance.

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Glaucoma and ocular hypertension
Study type	Observational non invasive

Summary

ID

NL-OMON45451

Source
ToetsingOnline

Brief title
Motion perception in glaucoma

Condition

- Glaucoma and ocular hypertension

Synonym
Glaucoma; POAG

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Groningen
Source(s) of monetary or material Support: Ministerie van OC&W,European committee;Uitzicht

Intervention

Keyword: Glaucoma, Luminance, Motion perception

Outcome measures

Primary outcome

Our study will make measurements of motion perception thresholds for over a range of different oscillation frequencies and luminances.

The motion perception threshold is the minimum oscillation amplitude at which motion is perceivable. This will be determined for each oscillation frequency and luminance. Motion perception thresholds can then be compared between the healthy control group and glaucoma patients.

Secondary outcome

N/A

Study description

Background summary

Glaucoma is an eye disease in which a degeneration of retinal ganglion cells results in loss of the visual field and - if left untreated - blindness. Early stages are usually unnoticed and for that reason, screening is advisable. Current methods for screening glaucoma often do not detect glaucomatous defects until a large amount of irreversible damage has occurred. Moreover, recent studies have uncovered that significant visual complaints exist even if the visual field is still intact or only mildly affected. For example, many glaucoma patients give-up driving after sunset in an unexpectedly early disease stage. One possible explanation for this is impaired visual function specifically at low luminances. We recently studied and confirmed this possibility. Alongside progressive visual field loss, individuals with glaucoma are also found to have deficits in seeing moving objects (Shabana et al., 2003), not unimportantly for driving. Furthermore, a decline in motion perception may precede loss of other visual functions. A screening test based

around motion perception may, therefore, enable glaucoma diagnoses and treatment decisions to be made sooner, thereby preserving more of the visual system. In general, we aim to better understand why glaucoma patients express visual complaints in disease stages that are considered early based on conventional visual field testing. The fact that motion detection is performed by a subclass of retinal ganglion cells, the primary site of glaucomatous damage, makes a detailed study of motion perception in glaucoma long overdue.

One commonly used task for assessing motion perception in glaucoma is a motion displacement test, where the subject must indicate if they perceive a simple line stimulus to be moving. Using this task, previous studies have found impaired motion perception in peripheral regions of the visual field that were apparently healthy, according to standard perimetry tests (Westcott et al., 1998). However, there has been a lack of research which focuses on the integrity of the motion perception pathway in foveal vision, the most important part of the visual field from the point of view of the patient. Our study will investigate motion perception thresholds of an oscillating line stimulus seen with foveal vision, over a range of oscillation frequencies, in glaucoma and healthy subjects. Comparisons of the oscillation amplitudes required to perceive motion can then be made between glaucoma and control groups to assess determine if motion perception deficits are present in foveal fixation in glaucoma. Given our recent studies that showed the importance of luminance, we will perform the measurements over a range of luminance values.

Study objective

The main objective is to compare motion perception thresholds in glaucoma patients with healthy subjects as a function of oscillation frequency and luminance.

Study design

Case-control study

Study burden and risks

Patients and healthy subjects will have one visit to the Laboratory of Experimental Ophthalmology to perform a motion perception experiment. Healthy subjects will undergo screening to assess their eye health, which will comprise a questionnaire (see Appendix F1), letter chart, visual field test, optical coherence tomography (OCT) test of retina and optic nerve head, and intraocular pressure (IOP) measurement. Screening will take around 20 minutes. The eye will not be touched during screening, nor are mydriatic drugs required for pupil dilation. If abnormal screening results are obtained for healthy subjects, they will be referred to their GP. Detection of signs of an eye condition may cause psychological stress, however, an early diagnosis will allow treatments to be

initiated and therefore more preservation of visual functioning. Glaucoma patients will not perform any screening tests, therefore there is no risk of identifying any other eye conditions. Subjects with glaucoma will be recruited from a population of glaucoma patients who visit the ophthalmology clinic at the UMCG. For the recruitment of healthy subjects, poster adverts (see Appendix E3) will be placed in and around the UMCG. Patients and healthy subjects will spend 1.5 hours and 2 hours in our lab, respectively, to complete the required tasks.

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

Glaucoma patients between ages 50 and 75, who visit the ophthalmology clinic at University Medical Centre Groningen, that have provided the informed consent form and meet the

inclusion-exclusion criteria.;Healthy subjects between ages 50 and 75, who have provided the informed consent form and returned the questionnaire with results which do not indicate ophthalmic abnormalities.

Exclusion criteria

Glaucoma Patients:
Visual acuity less than 0.8
Non-glaucomatous visual field loss;Healthy Subjects:
Visual acuity less than 0.8
Any visual field loss
Intraocular pressure above 21 mmHg
Positive family history of glaucoma

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:	Diagnostic

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	21-04-2017
Enrollment:	72
Type:	Actual

Ethics review

Approved WMO

Date:	30-01-2017

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	ID
CCMO	NL59641.042.16