Identification of proteins and genes involved in proliferative diabetic retinopathy

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Identification of the proteins that are involved in neurite outgrowth in PDR. We want to determine what protein levels are increased in the vitreous by local production and which RNA transcripts are present in the fibrotic membranes of patients with...

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Retina, choroid and vitreous haemorrhages and vascular disorders
Study type	Observational invasive

Summary

ID

NL-OMON39671

Source
ToetsingOnline

Brief title
Factors involved in PDR

Condition

- Retina, choroid and vitreous haemorrhages and vascular disorders

Synonym
proliferative diabetic retinopathy. Vessel newgrowth in retina in diabetes

Research involving
Human

Sponsors and support

Primary sponsor: Academisch Medisch Centrum
Source(s) of monetary or material Support: subsidies

Intervention

Keyword: genes, proliferative diabetic retinopathy, proteins, vitreous

Outcome measures

Primary outcome

Primary study parameter is presence of to-be-detremined proteins in the

vitreous of patients with PDR compared with healthy persons.

Furthermore, using microarray analysis, RNA transcripts will be determined that

are increased in patients with PDR compared to non-diabetic patients.

Secondary outcome

not applicable

Study description

Background summary

Proliferative diabetic retinopathy (PDR) is the most serious of the ocular complications of diabetes. Retinal traction often occurs late in the disease and is due to neovascular growth, bleeding from the new vessels, development of neovascular epiretinal membranes (ERMs), and vitreous contraction. ERMs form on the surface of the neuroretina and have been postulated to represent part of the wound healing process. Research on epiretinal membranes or fibrovascular membranes has mainly been focussed on their angiogenic potential. To date, no extensive analysis has been done to investigate the involvement of neuronal growth factors. We recently reported however that the epiretinal proliferation of membranes cannot occur without the presence of neuronal cells, such as ganglion cells or Müller cells, which serve as a support and guide formation of new blood vessels. Neurites did not only sprout within the retina, but were also found to grow out of the retina into fibrovascular membranes in proliferative diabetic retinopathy (PDR) as well as in epiretinal membranes from other causes. In previous studies we found simultaneous growth of epiretinal membranes (ERMs) and certain retinal nerve cells (ganglion cells). These nerve cells may have very long neurites. Along these neurites bloodvessels can grow in PDR. Untill now facors involved in neurite outgrowth and the development op ERMs have not yet been identified.

Recent technological developments like micro-array analysis and antibody-arrays give rise to new opportunities in identifying genes and their protein products in specific tissues. To determine which factors are involved in the outgrowth of neural cells, we want to perform a micro-array analysis on surgically removed membranes in patients with PDR. We also want to do research on the vitreous of these patients. Antibody-array can screen large numbers of proteins in the vitreous. To combine the results of both techniques, we hope to find factors involved in neurite outgrowth in these patients. Because patients with PDR often have bleedings in the eye , and increased vascular permeability occurs in DR , plasma of these patients will be analyzed as well to check whether an increase of certain proteins in the vitreous may be caused by leakage from the blood. In addition an extra tube of blood is collected for analysis of DNA. This allows us to determine genetic variants of the proteins have been found and correlate these with protein levels and clinical parameters such as the degree of vessel growth, connective tissue formation, and neurite outgrowth.

Vitreous humor and epiretinal membranes are residual materials that are normally removed during surgery and will provide no additional burden for the patient. Preoperatively blood will be collected for standard screening. Two extra tubes will be collected for research. This needs no extra injection and gives minimal burden for the patient.

Study objective

Identification of the proteins that are involved in neurite outgrowth in PDR.
We want to determine what protein levels are increased in the vitreous by local production and which RNA transcripts are present in the fibrotic membranes of patients with PDR compared to non-diabetic individuals.

Study design

Case control-study

Study burden and risks

There will be no extra risk involved for the patient. The material which is used in this study is residual material, this material is normally destroyed at the end of surgery. We will use it for research. The only extra burden for the patient is reading the research information folders. Normally blood is taken before surgery. In case of participation in the study extra blood will be drawn from the patient. So practically there is no real extra burden for the patient.

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

Patients with proliferative diabetic retinopathy who need a vitrectomy.
Controlgroup: Patients (without diabetes mellitus) with a macular hole, a macular pucker or vitreous floaters who need a vitrectomy

Exclusion criteria

No informed consent
Age >18 years
Legal incapacity
In the control group:
No informed consent

Age >18 years
Legal incapacity
Diabetes mellitus

Study design

Design

Study type:	Observational 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):	13-08-2014
Enrollment:	50
Type:	Actual

Ethics review

Approved WMO

Date:	27-02-2014
Application type:	First submission
Review commission:	METC Amsterdam UMC

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	NL38847.018.12