Program

Advances in Glaucoma Research and Clinical Science

Amsterdam, The Netherlands

SEPTEMBER 26–28, 2019

Advances in Glaucoma Research and Clinical Science

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Program at a Glance

Thursday September 26, 2019 – Special focus day: Rho Kinase

07:00–20:00	Registration open
10:00–20:00	Exhibition open
08:30–10:00	**Session 1: Neuroprotection**
10:00–10:30	Coffee Break
10:30–12:00	**Session 2: Outflow drugs**
12:00–14:00	Lunch Break
14:00–15:30	**Session 3: Netarsudil**
15:30–15:45	Coffee Break
15:45–17:15	**Session 4: Glaucoma therapy in the future**
17:15-20:00	**An Amsterdam-spirited welcome reception at the congress venue**

Friday September 27, 2019

07:30–17:30	Registration open
08:00–17:30	Exhibition open
08:30–10:00	**Session 5: Basic science I**
10:00–10:30	Coffee Break
10:30-12:00	**Session 6: Basic science II**
12:00–14:00	Lunch Break
14:00–15:30	**Session 7: Pressure fluctuation and glaucoma**
15:30–15:45	Coffee Break
15:45–17:00	Poster walk session
17:30-20:45	**Various tour options; see page 12 for details.**
20:30-23:00	**Optional Congress Dinner at the International Theater Amsterdam (Downtown Leidseplein)**

Saturday September 28, 2019

08:00–17:30	Registration open
08:00–16:00	Exhibition open
08:30–10:00	**Session 8: Future technologies**
10:00–10:30	Coffee Break
10:30–12:00	**Session 9: Medical therapies**
12:00–14:00	Lunch Break
14:00–15:45	**Session 10: Surgical options for glaucoma I**
15:45–16:00	Coffee Break
16:00–17:15	**Session 11: Surgical options for glaucoma II**

Welcome

Thank you for coming to our first annual Amsterdam Glaucoma Meeting, hosted by Kugler Publications.

Is there psychic and spiritual space for yet another glaucoma meeting? We think so. Our belief is that we benefit personally and professionally from attending a broad spectrum of meetings, with differing sizes and formats as well as goals and levels of interaction. In addition to the larger and more general didactic meetings, there is certainly space for smaller meetings, their very size making them more conducive to highly participatory discussions while also allowing a more focused scientific orientation. This Amsterdam meeting leverages strengths from both approaches.

We hope to accomplish several things with this meeting. First, we want to build on our soon-to-be three-volume **Glaucoma Research and Clinical Advances** series (edited by Paul A. Knepper and John R. Samples), as well as launch our **New Concepts in Glaucoma Surgery** series, whose upcoming first volume, Current Developments in Glaucoma Surgery and MIGS (edited by Ike Ahmed and John R. Samples) is an in-depth exploration of MIGS. Both series are developed and published by Kugler Publications.

Since 2001, John has co-chaired the Trabecular Meshwork Study Club, which was co-founded with Shan Lin. This two-day meeting, held in association with the American Society for Cell Biology, is devoted solely to meshwork and outflow science. To this day, the Trabecular Meshwork Study Club focuses on basic science and the presentation of yet unpublished original research. Largely attended by researchers – Ernst Tamm has been an active participant for years –, this invite-only activity demands everyone's active participation, each presentation followed by active question and answer sessions. Dave Epstein, a huge proponent of outflow drugs, was a stalwart supporter and dynamic member of this meeting up to his untimely death. It is therefore fitting to honor Dave in our first Amsterdam Glaucoma Meeting by discussing the new class of outflow drugs that he spearheaded along with Casey Kopczynski; they represent a truly new class and will appear in Europe in the near future. We have only just begun to scratch the surface of this new class of drugs and its many important biological functions.

Around 2001, Shan and John also co-founded another two-day meeting devoted to clinical glaucoma and intended to assist practicing general ophthalmologists in improving their ability to treat glaucoma by providing clinical and evidence-based updates in an intimate setting conducive to learning. It follows a classic lecture format, followed by question and answer sessions. It is characteristic of that meeting that the faculty mingle extensively, ensuring discussions are able to continue beyond the sessions.

Here in Amsterdam we are drawing on what we believe is the best of both worlds. Our aim is to keep it small enough to ensure extensive personal interaction, yet large enough to bring novel information to the didactic sessions, thus striking a balance between basic science and clinical presentations. The Amsterdam Glaucoma Meeting intends to reflect the open-mindedness that guides scientific progress and is characteristic for The Netherlands in general, and Amsterdam specifically. In future years we want the meeting to develop organically, remaining open to the possibility of tweaking attendance size and regulating the degree of scientific versus clinical content while fulfilling our main ambition: a meeting that allows time and opportunity for personal interactions which create opportunities for collaboration and discussions. We will be especially satisfied if these collaborations find their way into the Glaucoma Concepts book series to reach an even wider audience.

Thanks for joining us this year. It is always challenging to start a new meeting; the confidence placed in us by you all is significant. We're looking forward to discussing not only science, but also what we can do to strengthen this meeting in the hope of counting you in for future editions.

John R. Samples
Congress Co-Chair

Ernst Tamm
Congress Co-Chair

Table of Contents

Program

Our Concept

The New Concepts in Glaucoma book series initiative will be expanded with an annual meeting in Amsterdam. The series is neither book nor journal. Books are infrequently edited and rarely up-to-date for more than a year or two; journals are really devoted to the standard experimental format and no longer permit authors to wander into speculation or lengthy discussions of what might come next. There is room for a plurality of publishing approaches. All of these formats have their place and all have different purposes in moving a field forward.

This format is designed to allow us to consolidate new information, and to promote the opportunity for speculation in glaucoma. It does so in both the basic sciences and clinical sciences. It is our hope that this consolidation of hypotheses and theories, along with presenting new theories will propel us toward a more rapid cure for glaucoma. It will be refined and updated over the years to come to keep it the most essential of all references.

The (bi)annual meeting will build on this mission by facilitating live discussion/interaction and further dissemination of ideas and current research, and their translation into the everyday practice. Soon all artticles and captured content of the meeting(s) will find a home at www.glaucomaconcepts.com.

Program Committee

Chairs

John Samples
Clinical Professor, Washington State University School of Medicine, Spokane, WA, USA

Ernst Tamm
University of Regensburg, Institute for Human Anatomy, Regensburg, Germany

Program Wednesday

Wednesday September 25, 2019	
16:00–20:00	Registration open
16:00-20:00	Table top setup for exhibitors

Scientific Program Thursday

Thursday September 26, 2019 – Special focus day: Rho Kinase	
07:30–20:00	Registration open
07:30-09:30	Table top setup for exhibitors
10:00–20:00	Exhibition open
07:30-15:00	Poster mounting
08:30–10.00	**Session 1: Neuroprotection**
08:30-08:40	1.1. Introduction John Samples
08:40-09:00	1.2. Concepts of proving neuroprotection Richard Lee
09:00-09:20	1.3. Concept of trabecular protection from brimonidine to rho kinase inhibitor Ernst Tamm
09:20-09:40	1.4. Finding the Ying and Yang of Rho with a blue native gel Paul Knepper
09:40-10:00	Questions & Answers John Samples, moderator
10:00–10:30	Coffee Break at Exhibition area
10:30–12:00	**Session 2: Outflow drugs**
10:30-10:50	2.1. The vision of Dave Epstein: Why we need an outflow drug Casey Kopczynski
10:50-11:10	2.2. Rho kinase inhibitors as a class: A multitude of biological effects Dan Stamer
11:10-11:30	2.3. Rho kinase inhibitors in glaucoma: Basic science studies Ernst Tamm
11:30-11:50	2.4. Rho kinase inhibitors in Japan Casey Kopczynski
11:50-12:00	Questions & Answers Dan Stamer, moderator
12:00–14:00	Lunch Break
14.00–15.30	**Session 3: Netarsudil**
14:00-14:20	3.1. Clinical studies on Netarsudil Shan Lin
14:20-14:40	3.2. Approval of Netarsudil and initial experience with its clinical use in the US Casey Kopczynski
14:40-15:00	3.3. Clinical studies on Netarsudil combined with a prostaglandin Casey Kopczynski
15:00-15:20	3.4. Side effects of Netarsudil Shan Lin
15:20-15:30	Questions & Answers Shan Lin, moderator
15:30–15:45	Coffee Break
15:45–17:15	**Session 4: Glaucoma therapy in the future**
15:45-16:05	4.1. What will the future of glaucoma therapy be like? How many bottles? John Samples
16:05-16:25	4.2. The far future of glaucoma therapy Dan Stamer
16:25-16:45	4.3. Development time lines; availability of the class; what about similar classes such as the serine kinase class Casey Kopczynski
16:45-17:15	Questions & Answers John Samples, moderator
17:15-20:00	**An Amsterdam-spirited welcome reception at the congress venue**

Scientific Program Friday

Friday September 27, 2019	
08:00–17:30	Registration open
08:00–17:30	Exhibition open
08:30–10.00	**Session 5: Basic science 1**
08:30-08:50	5.1. The genetics of glaucoma John Samples
08:50-09:10	5.2. The biochemistry of trabecular and uveoscleral outflow Ernst Tamm
09:10-09:30	5.3. The common themes in the biochemistry of glaucoma: Misfolded proteins, cytotoxicity and trabecular protection Paul Knepper
09:30-09:50	5.4. Glaucoma as a disease of perfusion IOP and intracranial pressure Ingrida Januleviciene
09:50-10:00	Questions & Answers Ernst Tamm, moderator
10:00–10:30	Coffee Break
10:30–12:00	**Session 6: Basic science 2**
10:30-10:50	6.1. Mitochondria and glaucoma Miriam Kolko
10:50-11:10	6.2. The biology of exfoliation glaucoma: Past and future Ernst Tamm
11:10-11:30	6.3. Global prevalence of glaucoma Rupert Bourne
11:30-11:50	6.4. Glaucoma in Asia Shan Lin
11:50-12:00	Questions & Answers Ernst Tamm, moderator
12:00–14:00	Lunch Break
14.00–15.30	**Session 7: Pressure fluctuation and glaucoma**
14:00-14:20	7.1. The biology of pressure fluctuation in glaucoma Dan Stamer
14:20-14:40	7.2. Glaucoma and pressure fluctuation Kaweh Mansouri
14:40-15:00	7.3. Corticosteroid induced glaucoma Dan Stamer
15:00-15:20	7.4. Clinical evaluation of the optic nerve Hans Lemij
15:20-15:30	Questions & Answers Dan Stamer, moderator
15:30–15:45	Coffee Break
15:45-17:00	Poster Walk Session
17:30-20:45	**Various tour options; see page 12 for details.**
21:00-23:00	**Optional Congress Dinner at the International Theater Amsterdam (Downtown Leidseplein)**

Scientific Program Saturday

Saturday September 28, 2019

08:00–17:30	Registration open
08:00–17:30	Poster tear down
08:00–16:00	Exhibition open
16:00-20:00	Exhibition tear down
08:30–10.00	**Session 8: Future technologies**
08:30-08:50	8.1. Foibles and flaws in OCT interpretation Hans Lemij
08:50-09:10	8.2. Measuring the eye: angle and optic nerve Shan Lin
09:10-09:30	8.3. Future forms of laser trabeculoplasty John Samples
09:30-09:50	8.4. Treating angle closure now and in the future Shan Lin
09:50-10:00	Questions & Answers Shan Lin, moderator
10:00–10:30	Coffee Break
10:30–12:00	**Session 9: Medical therapies**
10:30-10:50	9.1. Current and future role of fixed combination therapy in glaucoma Tasos Konstas
10:50-11:10	9.2. Alternative medications in the treatment of glaucoma John Samples
11:10-11:30	9.3. Interventions to improve adherence in glaucoma Tasos Konstas
11:30-11:50	9.4. The toxicity of ophthalmic preservatives Andrew Tatham
11:50-12:00	Questions & Answers John Samples, moderator
12:00–14:00	Lunch Break
14.00–15.30	**Session 10: Surgical options for glaucoma 1**
14:00-14:30	10.1. Antimetabolites and glaucoma surgery Tony Fea
14:30-15:00	10.2. The categories and future of MIGS Kaweh Mansouri
15:00-15:30	10.3. Subconjunctival to anterior chamber shunts Andrew Tatham
15:30-15:45	Questions & Answers John Samples, moderator
15:45–16:00	Coffee Break
16:00–17:30	**Session 11: Surgical options for glaucoma 2**
16:00-16:20	11.1. Suprchroidal shunts Tony Fea
16:20-16:40	11.2. Canal based surgery Kaweh Mansouri
16:40-17:00	11.3. Improvements in cyclodestruction P3,G6 and Micropulse Shan Lin
17:00-17:20	11.4. The future of neuroprotection Richard Lee
17:20-17:30	Questions & Answers John Samples, moderator

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Accreditation

EACCME® Credits

The Advances in Glaucoma Research and Clinical Science Congress 2019, Amsterdam, Netherlands, 26/09/2019-28/09/2019 has been accredited by the European Accreditation Council for Continuing Medical Education (EACCME®) with 13 European CME credits (ECMEC®s). Each medical specialist should claim only those hours of credit that he/she actually spent in the educational activity.

Through an agreement between the Union Européenne des Médecins Spécialistes and the American Medical Association, physicians may convert EACCME® credits to an equivalent number of AMA PRA Category 1 CreditsTM. Information on the process to convert EACCME® credit to AMA credit can be found at:

www.ama-assn.org/education/earn-credit-participation-international-activities.

Live educational activities, occurring outside of Canada, recognised by the UEMS-EACCME® for EACCME®s are deemed to be Accredited Group Learning Activities (Section 1) as defined by the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada.

EACCME® Credits

Each participant can only receive the number of credits he/she is entitled to according to his/her actual participation at the event once he/she has completed the feedback form. Cf. criteria 9 and 23 of UEMS 2016.20.

CMEC®s per day:
26.09.2019 – 4.00
27.09.2019 – 4.00
28.09.2019 – 5.00

The EACCME® awards ECMEC®s on the basis of 1 ECMEC® for one hour of CME with a maximum of 8 ECMEC®s per day. Cf. Chapter X of UEMS 2016.20.

Certificate of Attendance

The certificate of attendance will be sent to you via email after completion of the congress feedback form (as per EACCME® credits rules).

The link to this form will be provided to all participants after the meeting.

MedTech Compliance

We are pleased to inform you that our congress has been found compliant with the MedTech Europe Code of Ethical Business Practice.

Poster Presentations

- The poster sessions will follow the classic ARVO model: people stand by their poster and explain why it's important. There is time designated for a poster round within the program on Friday September 27, 2019 from 15:45 – 17:00.
- See all poster abstracts on page 13.
- Poster should be mounted no later than Thursday September 26, 2019, 15:00. Materials for mounting are provided on site. Do come to the registration desk if you need assistance.
- One poster board will be allocated per poster presentation, with a number identifying each poster.
- Posters will be displayed in the Poster Area, which is located in the Ambassador Room of the Rosarium.

Social Program

Thursday to Friday

During the conference dates you are welcome to enjoy a free ride with the train in the park (operational from 11:00 until 17:00 each day). The starting point is less than a minute away from the venue; your badge is your ticket!

Thursday September 26, 2019

17:15–20:00

On Thursday there will be a welcome reception in the congress venue with entertainment.

Plenty of food and drinks will be served at the end of this first day of the congress. This welcome reception will be a great opportunity to network with your colleagues and relax outside on the venue terrace and get energized for the following days.

The Welcome Reception is included in the conference fees.

More information at registration desk

Friday September 27, 2019

17:30–23:00

For Friday's social program we are offering several building blocks (at costs and subject to availability) with which you can create an evening catered to your own devices. This is the short list, more information can be found at the registration desk and on our website: www.glaucomaconcepts.com/congress/program/social-program-friday or use this QR-code.

1. Canal boat tour with bites & drinks - offered free of charge; registration required.

Either take the boat to the last stop or get another stop to go on one of the tours (2-5)

The tours:

2. Van Gogh Museum Tour

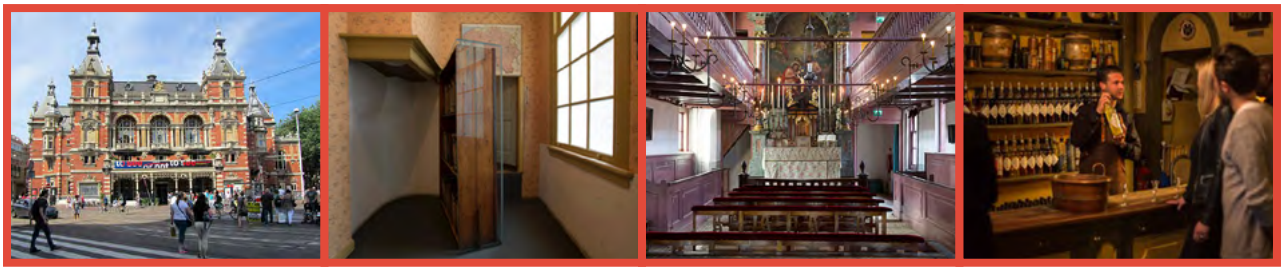
3. Our Lord in the Attic Museum Tour & Spirits Tasting at Wynand Fockink

4. Houseboat Museum & Spirits Tasting at craft distillery A van Wees

5. Guided Tour at Anne Frank Museum & guided tour through literary Amsterdam

After the tours, we invite you to join us for a buffet dinner at a special downtown location:

6. Dinner at the International Theater Amsterdam (Downtown Leidseplein)



Abstracts

* = presenting author

P01 Medication Adherence By Glaucoma Patients Attending a Nigerian Hospital

Kayode Ajite*[1], Christianah Fadamiro[1], Lyiade Ajayi[1], Olusola Omotoye

[1]Department Of Ophthalmology, Ekiti State University, Ado Ekiti, Nigeria

Background

Glaucoma is a chronic disease necessitating a lifelong treatment in order to prevent the irreversible blindness occurrence. Non adherence to medical treatments by glaucoma patients can lead to resultant visual impairment, blindness, and disabilities. The aim of this study is to determine the adherence to medication glaucoma and identify factors responsible for non-adherence in patients attended to in our hospital.

Methods

A cross-sectional study was conducted from March 2018 to July 2018 at Ekiti state university teaching hospital, Ado Ekiti. Consecutive patients with glaucoma, aged 18 years or above, who have been on at least one topical glaucoma medication for at least six months and were attending the glaucoma clinic during the study period were included. A questionnaire was used to gather data about patients' demographics and factors affecting adherence to medical treatments. The Morisky Medication Adherence Scale was used to evaluate the adherence to glaucoma medication. Results were analyzed using SPSS version 18. Descriptive statistics and chi-square were used.

Results

A total 93 (27.5%) patients were non adherent to glaucoma therapy.(TABLE 1). Non adherence was associated with finance/cost of medication (P = 0.03), forgetfulness (P = 0.01) and side effects of drops (P = 0.04).(Fig 2). Other barriers were difficulty with drop administration (P = 0.02), older age (P = 0.04), advanced stage of glaucoma (P = 0.01), longer frequency of follow up(P = 0.00). Sex-(P = 0.53), level of education(P = 0.09), and marital status(P = 0.77) were not statistically significantly associated with non-adherence to anti-glaucoma drug treatment.

Conclusion

Almost one third of the studied patients were non adherent to medication, this is an important clinical problem in the management of glaucoma. Patient education and adequate counseling may help in improving the patients' adherence to glaucoma medications.

References

1. Lemlem Tamrat, Girum W. Gessesse, Yeshigeta Gelaw. Adherence to Topical Glaucoma Medications in Ethiopian Patients. Middle East Afr J Ophthalmol. 2015; 22(1): 59–63. doi: 10.4103/0974-9233.148350
2. Morisky DE, Green LW, Levine DM. Concurrent and predictive validity of a self-reported measure of medication adherence. Med Care. 1986;24(1):67-74.
3. Adeola Olukorede Onakoya, Chigozie Anuli Mbadugha. Self-reported adherence rates in glaucoma patients in Southwest Nigeria
4. Tayebeh Movahedinejad, Mohsen Adib-Hajbaghery. Adherence to treatment in patients with open-angle glaucoma and its related factors. 2016; 8(9): 2954–2961

P02 Complications of Ahmed Glaucoma Valve Implant in Jordanian Patients

Asem Alqudah*[1]

[1]Faculty of Medicine, Jordan University of Science and Technology (JUST), Jordan

Background

To compare the rate of complications of Ahmed Glaucoma Valve implant in Jordanian glaucoma patients to Caucasian people.

Methods

We report 56 eyes of 53 patients with follow-up time of at least 6 months. The database included the indication for surgery, the intraocular pressure preoperatively, and postoperatively at different time visits, and the complications at each post-operative visit. The type and proportion of complications were documented and compared to historical data found in previous studies (n = 57 eyes) of Caucasian people using nonparametric statistical tests.

Results

Bleb encapsulation was found in twenty-four eyes (42.8%) undergoing Ahmed Glaucoma Valve implant, which is higher than the rate of encapsulation in Caucasian people (23%, P : 0.02). Hypotony (IOP of less than 5 mmhg) was encountered in 2 eyes (3.5%), eye motility defects persistent for six months post-operatively was documented in one eye (1.7%), and tube related complications were found in one eye (1.7%). Tube erosion was encountered in only one eye (1.7%), a rate that is significantly lower than the rate encountered in different studies in Caucasians (5-14.3%, P < 0.05).

Conclusion

Bleb encapsulation is the most common complication for Ahmed Glaucoma Valve implant in Jordanian patients, its rate is higher than the rate of encapsulation in Caucasians. Tube erosions have significantly lower rate in Jordanian people than in Caucasians. Whether these differences are related to genetic and racial differences in conjunctival and Tenon's capsule thickness need to be further investigated.

References

1. Eibschitz-Tsimhoni M, Schertzer RM, Musch DC, Moroi SE. Incidence and management of encapsulated cysts following Ahmed glaucoma valve insertion. J Glaucoma. 2005 Aug;14(4):276-9.
2. Ayyala RS, Zurakowski D, Smith JA, et al. A clinical study of the Ahmed glaucoma valve implant in advanced glaucoma. Ophthalmology. 1998;105(10):1968–1976.
3. Montanez FJ, Laso E, Suner M, Amaya C. Ahmed drainage device implant. Our experience between 1995 and 2003. Arch Soc Esp Oftalmol. 2005;80(4):239–244.

P03 Effectiveness Of Selective Laser Trabeculoplasty In Glaucoma Patients: A 6 Years Follow Up Study

Indira Aristeguieta*[1], Eleonora Ayala[1], Karla Gonzales-Farro[1], Alfonso Anton[1], Laura Beltran-Agullo[1]

[1]Department of Glaucoma, Institut Catala de Retina, Universitat Internacional de Catalunya, Barcelona, Spain

Background

The use of laser trabeculoplasty (SLT) to lower intraocular pressure (IOP) has provided an alternative strategy to treat open angle glaucoma (OAG) or ocular hypertension (OHT). SLT lowers IOP by enhancing aqueous humor outflow through the trabecular meshwork. It induces less coagulative damage than argon laser trabeculoplasty. The effect of SLT diminishes over time and some patients may need more treatment or surgery.

Purpose

To evaluate long-term effectiveness of SLT in OAG/OHT.

Methods

Retrospective cohort study. All patients with OAG/OHT treated in 2012 with 180° SLT were included. Patients with less than 1 year of follow up were excluded. Following SLT, patients were examined at 6, 12, 24, 36, 48, 60 and 72months. In each visit IOP was measured, and fundus and anterior segment were examined. Structural images and visual fields were performed to asses glaucoma progression.

Results

78 eyes of 49 patients were included. Mean age was 65,2±12,2 years old. Forty two eyes had OAG, 6 pseudo-exfoliation glaucoma, 2 pigmentary glaucoma, 2 aphakic glaucoma and 26 had OHT. The mean follow-up was 5,2±1,4 years. Mean previous IOP was 21,2±3,7 mmHg. After treatment, and excluding patients who required surgery, IOP had significantly decreased to 17,1±3,2 mmHg at one year (n=73) (P<0,001) and to 17,4±3.5 mmHg (P<0,001) at 6 years of follow-up(n=41). The number of drugs used was 2±1,1 before treatment and 1,9± 1,2 (n=41; P=0,55) after 6 years. A total of 35 eyes (27,3%) needed more than one SLT session to achieve the desired IOP and 18 eyes (23,1%) needed glaucoma surgery in a mean time of 2 years after the first SLT. None of the patients had major complications related to SLT treatment.

Conclusion

Although the effect of SLT decreases with time, our study shows that it can be an effective technique to significantly lower IOP after 6 years of follow up.

P04 Is Exfoliation Glaucoma An Autoimmune Disease?

Marcelo Ayala*[1], Sabeen Asad Khan[2], Andreas Tilevik[3]

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Background

Exfoliation glaucoma (XFG) is typically an aggressive disease with a poorer prognosis compared with primary open angle glaucoma. Patients with XFG may experience larger IOP fluctuations, more significant visual field loss and disc damage, reduced response to medications, more rapid progression, and require surgical management. The aim of this pilot study was to perform autoimmune profiling of serum samples of patients diagnosed with exfoliation glaucoma.

Methods

Serum samples from 30 patients of known exfoliation glaucoma were taken and stored at -80 till further usage. The tubes were further centrifuged at 27000xg, at 40C, for 30 minutes to remove any cells left in the samples. The samples were transferred to the slides containing the antigen arrays. Each array included 384 antigens. As controls, ten serum samples from anonymous blood donors were taken from the Facility's Global Immunodeficiency Project (GIDP/IMD). Each sample was screened for 3072 antigens (8 print batches x 384 antigens). By using a cut-off value for the median absolute deviations (MADs) around the median of 70, the intensity values were converted to binary data (reactive or unreactive to an antigen).

Results
The results showed that 293 antigens were reactive in at least one sample, and seven antigens were reactive in seven or more samples. Antigens derived from the genes EPM2A, SCG2 and VAV2 were found to generate reactivity in at least four patients.

Conclusion
Our preliminary results indicate that patients with exfoliative glaucoma show the presence of autoantibodies against several interesting antigens. Further investigations, including bigger sample size, are planned.

References

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P05 Association of NT-proANP Level in Plasma and Humor Aqueous with Primary Open-Angle Glaucoma

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Background
In recent years interest about glaucoma biomarkers has increased significantly. It has been reported that potential biomarkers could be analysed in blood plasma, also in materials such as tears and aqueous humor where biomarkers could be more specific. Natriuretic peptides (NP) are bioactive polypeptides, which includes three main types- ANP, BNP and CNP. NP realize their functions through different types of transmembrane guanyl cyclases which are also called NP receptors. In different studies an association between ANP and ocular pathologies have been established. NP have been found in ocular vascular endothelium and also trabecular meshwork. It has been established that high intraocular pressure promotes increase of ANP production by the epithelium of the ciliary body in the aqueous humor.The aim of this study was to determine differences in the levels of NT-proANP in the plasma and aqueous humor of glaucoma and cataract patients and to evaluate whether any relationships are present.

Methods
The study group consisted of 58 patients with primary-open glaucoma (POAG) undergoing trabeculectomy surgery. The control group was comprised of 32 age-matched cataract patients. The concentration of the N-terminal fragment of the proatrial natriuretic peptide (NT-proANP, 1-98) in the aqueous humor and blood plasma samples was measured using an immunochemical method (ELISA).

Results
The plasma NT-proANP concentration was significantly increased in patients with POAG compared to that in the control group (7.00 vs. 4.65 nmol/L, P = 0.0054). Comparing NT-pro-ANP levels between patients with different POAG stages and the controls by ANOVA, the difference was still statistically significant (P = 0,0210). The NT-proANP concentration in the AH was significantly higher in the patients with POAG compared to the cataract group (0,47 vs. 0,09 nmol/L, P = 0,0112), and the difference was also statistically significant when the different POAG groups were compared to the controls (P = 0,0001). The mean NT-proANP values in the AH of patients with different POAG stages gradually increased. When performing ROC curve analysis on NT-proANP in the anterior chamber fluid, a higher resolution compared to NT-proANP in blood plasma in the case of glaucoma was observed. In the case of NT-proANP in the anterior chamber fluid, AUC was 0,865, sensitivity 88,5%, specificity 72,7%, cut-off value 0,075 nmol/L, CI 95% 0,778-0,947 (p<0,001).

Conclusion
POAG patients have increased ANP level in intraocular fluid. ANP concentration in aqueous humor correlates with the stage of glaucoma. A progressive increase in the concentration level of ANP in aqueous humor could indicate an increase in glaucomatous damage. We identified an association between the levels of NT-proANP in the plasma and the aqueous humor with POAG. Our data support the idea of the involvement of NP system in the development of POAG and highlight ANP as a possible biomarker of glaucoma.

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P06 Excimer Laser Trabeculostomy 12 Year Data

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Background

Excimer laser trabeculostomy (ELT), a laser-based MIGS procedure with no implants: enables consistent intraocular pressure-lowering in glaucoma patients over 12 years, both stand-alone and combined with phacoemulsification.

Purpose

To evaluate the long-term, 12 year, intraocular pressure lowering efficacy and safety of Excimer Laser Trabeculostomy (ELT), both as a stand-alone procedure and combined with phacoemulsification (ELT+Phaco) in patients with open-angle glaucoma (OAG) and in patients with co-existing OAG and surgical cataract.

Setting

Augen Laser Klinik, Detmold, Germany

Methods

24 patients were followed for 12 years. 11/46 eyes with open angle glaucoma or ocular hypertension treated medically underwent ab-interno Excimer Laser Trabeculostomy. 13/37 eyes with open angle glaucoma or ocular hypertension treated medically with surgical cataract underwent ELT combined with phacoemulsification. Patients were followed at 1 day, 1 month, 3 months, 6 months, 1 year, and every year thereafter until 12 years from initial treatment. The primary outcome measures are mean change in IOP (without washout) and number of glaucoma medications from baseline. Secondary outcome measures are change in visual acuity (BCVA), surgical complications, and adverse events (AE).

Results

At 12 years, the mean IOP in the ELT group was reduced by 28.5% from a pre-op IOP of 23.0±5.1mmHg to 16.5±3.6mmHg (p-value IOP <0.005). In the ELT+Phaco group, the mean IOP was reduced by 30.0% from a pre-op IOP of 20.8±5.8mmHg to 14.7±3.8mmHg (p-value IOP <0.002). The number of glaucoma medications at 12 years for the ELT group was 1.5±1.4 medications compared to 1.9±0.8 medications at pre-op (p-value meds 0.47). The number of medications for the ELT+Phaco group was 2.0±1.3 medications compared to 1.3±0.6 medications at pre-op (p-value meds 0.04).

Conclusion

ELT both as a stand-alone MIGS procedure and ELT+Phaco are clinically safe and effective and enable long-term, consistent, significant reductions in IOP in patients with OAG. Glaucoma medication requirements were similar to pre-op in the ELT alone group but increased in the ELT+Phaco group. 12-year post-ELT IOP reduction with no implants was equivalent to 1- & 5-year IOP-lowering data following combined phacoemulsification with iStent implants. This study presents the longest post MIGS procedure data which validates the concept of MIGS procedures for long-term IOP lowering.

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P07 Glaucoma Screening in Family Members of Glaucoma Patients in Eastern Region of Nepal

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Background

Family history plays an important role in the management of patients with glaucoma. First degree relatives of the patients with glaucoma have a risk than for people with no family history of glaucoma. Most of the relatives are unaware of their risk, sometimes even decades after treatment is initiated in their family. Patients with primary glaucoma should be advised to alert relatives to the need for adequate glaucoma screening and follow-up. Considering the difficulty in detecting the disease in its early stage and the likelihood of irreversible loss of retinal nerve fibers at the time of diagnosis, most of the time, glaucoma is an important public health problem.

Methods

In this prospective observational hospital based study, we determine the prevalence of glaucoma in first degree relatives of the patient diagnosed as glaucoma, attending the outpatient department at Ramlal Golchha Eye Hospital from June 2016 - May 2017.

Results

We invited 227 individuals, first degree relatives of 72 persons diagnosed as POAG/PACG, out of which 143 attended our hospital screening for glaucoma. Sixty one percent of the attendees were males and thirty nine were females. A total of 23 persons were identified as having glaucoma of which 9 persons were aged more than 60 years, 7 persons were aged 40-60 years, 4 of them were aged 20-40 years, 3 were aged 10-21 years.

Conclusion

Prevalence of glaucoma in first degree relatives is higher than rest of the general population. Screening of glaucoma in first degree helps in earlier detection and treatment of glaucoma. Awareness of screening in first degree relatives may also play a major role in early detection of glaucoma. It also reduces needless blindness due to glaucoma.

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P08 Suprachoroid structure and it's role in uveoscleral outflow

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Background

An alternative approach to treating glaucoma is the drainage of aqueous humor to the suprachoroidal space.[1] This space takes part in uveoscleral outflow, which can be increased with surgery.[2] Uveoscleral outflow was demonstrated with labeled albumin going down to the posterior suprachoroidal space.[3] Aqueous outflow requires pressure gradients, which are quite different for the uveoscleral flow.[3] Even a four-fold increase in anterior chamber pressure has little effect on the pressure gradient for the rate-limiting step of uveoscleral flow.[4] Unlike the conventional outflow, where pressure in venous vessels is lower than pressure in scleral sinus and anterior chamber, most of the parts of uveoscleral outflow pathway stay within the single cavity of tunica fibrosa. According to Pascal law, the pressure is distributed evenly throughout the eyeball. Therefore, the pressure along the entire suprachoroidal space is equal and uveoscleral outflow seems phisically impossible. Suprachoroidal space being the longest part of uveoscleral pathway, represent the most difficult component to explain. With the absence of pressure gradient there must be some dedicated scructures responsible for fluid passage. Due to lack of sufficient suprachoroid morphology data[5] there is a controversy regarding the mechanism of fluid flow along uveoscleral pathway.

Purpose

To perform an experimental study of autopsy donor eyes to identify structures possibly involved in fluid passage along the suprachoroidal space.

Methods

We used 16 autopsy donor eyes from local eye bank with no visible ophthalmopathology. Donors age ranged from 24 to 37 years. 10x25 mm scleral strip was removed from limbus towards posterior pole of the eye. We used irrigation with BSS in different directions to observe flow-induced movement of suprachoroidal lamellae. 3D-videorecording and in-vitro SD-OCT were used for visualization/registration. Histological sections and flat specimens of suprachoroid stained with hematoxylin-eosin, and vimentin stain were examined as well.

Results

Exposed suprachoroid looked like gentle veil covering the surface of choroid. Alternate fluid flow revealed a multi-layered three-dimensional structure of suprachoroid which is composed of multiple interconnected "choroid-based flaps" forming posteriorly opened pockets. Irrigation flow directed from posterior pole towards the limbus inflated these pockets (fig. 1). Reverse flow pressed lamellae back to choroid and collapsed the pockets (fig. 2). Histological examination of flat specimens and transverse sections with conventional stain revealed multiple "flocks" or "rags" with no certain structure. Vimentin stain unexpectedly demonstrated continuous films instead of indefinite "fibers". Relatively solid and posteriorly directed lamellae naturally resist the retrograde fluid movement while easily lean down to choroid when irrigated in proper direction from anterior segment towards posterior pole. Multiple interconnected posteriorly directed lamellae forms broad network of valves covering the entire choroid. Like many similar valve systems within the body such structure may convert different pressure fluctuations (due to blood pulse, external pressure, ciliary muscle contraction, etc) into sequential posterior movement of portions of fluid.

Conclusion

Valve-like structure of suprachoroid can be responsible for fluid passage along the uveoscleral outflow pathway.

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P09 Steroid Induced Glaucoma after Kidney Transplant

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Background

To determine the prevalence of steroid induced glaucoma and treatment characteristics in kidney transplant patients in a tertiary level multi speciality Institution

Methods

In this prospective cross-sectional study, the patients who underwent kidney transplant were enrolled and underwent comprehensive ophthalmological evaluation including intraocular pressure (IOP) measurement with Goldmann Applanation tonometry, visual field examina-

tion with Humphrey Field Analyzer, and gonioscopy. Cases with IOP >21 mm Hg, visual field defect, and optic disc cupping >0.7 or asymmetry of 0.2 or more were labelled as glaucoma whereas IOP >21 mm Hg with normal visual field designated as ocular hypertension (OHT).

Results

The mean age of patients was 399 (range: 25-60) years. Out of 72 patients with kidney transplant 7 (9.72%) patients were diagnosed with steroid induced glaucoma and 9 (12.5%) patients had ocular hypertension (OHT). Four (5.55%) patients underwent trabeculectomy to control IOP whereas 3 (4.16%) patients were controlled on anti-glaucoma medications. Best-corrected visual acuity <6/9 was noted in 23 (31.94%) patients in at least one eye. Other associated findings were cataract [30 (41.67%) patients], pseudophakia [8 (11.11%) patients], hypertensive retinopathy [10 (13.88%) patients], diabetic retinopathy [4 (5.55%)], branch retinal vein occlusion [1 (1.38%) patients] in at least one eye. The average follow-up was 30 months with interquartile range of 18-84 months. All patients were treated with immunosuppressive drugs like prednisolone, cyclosporine, tacrolimus, mycophenolate mofetil.

Conclusion

Kidney transplant patients must be screened for glaucoma and other ocular abnormality and should be on routine ophthalmological follow-up due to the possibility of steroid induced glaucoma.

P10 Enrichment Of Biodegradable Glaucoma Drainage Models With Cyclosporine A For Wound Healing Modulation In Comparison

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Methods

We analyzed the ability of 2 models of poly(lactic-co-glycolic) acid GD (DDA and SDA) to cumulate CsA from solutions with decreasing drug concentrations from 50,0 to 1,0 mg/ml for 15 minutes. In order to study the dynamics of CsA desorption in vitro drainage samples enriched with CsA were placed in containers with 9 ml balanced salt solution and kept at constant temperature 37 C° in a shaker (50-100 rpm). At specific times from 12 hours to 10 days drainage samples were removed from the solutions and residual CsA content was evaluated by means of chromatography-mass spectrometry.

Results

Drainage samples enriched in solutions with CsA concentrations exceeding 2 mg/ml released potentially toxic concentrations of CsA (more than 5,0 mg/ml)[1] during first hours. SDA enriched in CsA solution with drug concentration 6,25 mg/ml cumulated 3,2±0,26 µg and DDA cumulated 3,87±0,29 µg after exposure in solution with CsA concentration 1,6 mg/ml. Therapeutic concentration of CsA (0,05-0,1 µg/ml)[2] in SDA was maintained for 3±0,4 days, while DDA released therapeutic concentrations of CsA for 8±0,5 days.

Conclusion

1. Glaucoma poly(lactic-co-glycolic) acid GD can incorporate CsA;
2. DDA model of poly(lactic-co-glycolic) acid GD cumulates CsA better, than SDA model (3,9 µg against 3,2 µg);
3. DDA model of poly(lactic-co-glycolic) acid GD is a better candidate for enrichment with CsA as, unlike the SDA model, it releases the drug within therapeutic concentrations for a period of time long enough to overlap the moment when T-cells reach their peak amount (8±0,5 days against 3±0,4 days);
4. We developed a safe and simple method to maintain therapeutic concentration of CsA in vitro for a period of time essential in terms of fibroblast proliferation. This method is easily displayable in operation room and can potentially modulate wound healing in glaucoma surgery.

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P11 The Morphology Of Uveal Layers Of Trabecular Meshwork And Its Contribution To Uveoscleral Outflow

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Background

Currently the aqueous humor outflow considered to be separated in two different parts: trabecular and uveoscleral outflow pathways. The structure and the function of trabecular outflow is well known. The structure of the uveoscleral pathway is questionable, especially in terms of the "entrance" or, the other words, the exact place were the aqueous humor leaves the anterior chamber to enter the ciliary muscle spaces. The aim of the study was to specify the anterior chamber source of the uveoscleral outflow.

Methods

The perfusion of human cadaver eyes with India ink suspension through clear corneal tunnel was performed. The IOP was maintained at 30 mm of mercury. Lamellar scleral dissection revealed the ciliary muscle surface. After the superficial layer of the muscle was incised we observed gradually increasing flow of India inc-stained fluid. After formaldehyde fixation we performed further dissection of trabecular meshwork and ciliary muscle with subsequent preparation of flat specimens of different layers of trabecular meshwork as well as histological sections for light microscopy.
Histological sections revealed specific pattern of ink distribution.

Results

Histological sections revealed specific pattern of ink distribution: the ink particles go from the anterior chamber to the Schlemm's canal and particularly retain at the scleral spur. The main stream goes along the trabecular beams, bypass the scleral spur and flows into the ciliary muscle. Human trabecular meshwork was found consisting of 6 definite layers instead of 4 generally considered (fig.1). Only the 2nd and 3rd layers included ink particles. The 2nd layer contains the scleral spur and merges with the meridional part of ciliary muscle. The 3rd (uveal) layer extends into the radial portion of the ciliary muscle (fig.2).

Conclusion

Aqueous humor (AH) leaves the anterior chamber via trabecular meshwork in two directions: transtrabecular and paratrabecular. Transtrabecular flow conveys AH into the Schlemm's canal; paratrabecular flow continues into the uveoscleral pathway. Other structures of the anterior chamber play minor or no role in the AH outflow. In the sclero-uveal layer aqueous humor can flow towards the ciliary muscle down to the scleral spur but not beyond. In the uveal layer the fluid can freely pass into radial portion of ciliary muscle. As the uveal trabeculae continue directly into the clilary muscle bundles, the intertrabecular slits naturally continue directly into the spaces between the bundles.

P12 Pseudoexfoliating Glaucoma And Micrornas In Anterior Lens Capsule

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Background

Pseudoexfoliation syndrome is an age-related systemic disease that mainly affects the anterior structures of the eye. The exfoliative material is composed mainly of abnormal cross-linked fibrils that accumulate progressively in the anterior structures of the eye. The exact pathophysiological process remains unclear but the association of genetic and environmental factors are thought to play a role in the development and progression of extracellular exfoliative material accumulation. Small RNA (miRNA) is a kind of small noncoding single-stranded RNA that regulates complementary mRNA at the posttranscriptional level in eukaryotic organisms. As important regulatory factors, miRNAs play an important role in the occurrence and development of glaucoma and widely participate in regulating biological processes of glaucoma-related genes. To better understand the molecular changes in the anterior lens capsule. Under such conditions, we analyzed the miRNA profiles of anterior lens capsule in samples from patients with POAG and XFG compared to non-glaucoma controls.

Methods

Patients recruited were divided in three groups:
Group 1: Patients with Cataract (control)
Group 2: Patients with POAG (open angle glaucoma)
Group 3: XFG (Pseudoexfoliating glaucoma)
RNA was extracted from anterior lens capsule and human genome–wide microRNA array was performed. Comparisons between groups was studied to evaluate statistical significance differentially regulated miRNAs between groups. Real time PCR was performed to validate the results.

Results

We have identified 25 differentially expressed miRNAs in three different study groups which were significantly up or down regulated. Ten of these miRNAs were validated by real time PCR in anterior capsule of 12 patients from each group. These miRNAs are involved in different pathways regulating pseudoexfoliation glaucoma.

Conclusion

miRNAs found to express in the anterior lens capsule of patients with XFG may have role in stress induced pathway which may help in understanding of the disease and leading to search of new therapeutic targets.

P13 Real-Time Optical Imaging Of Schlemm's Canal And Distal Outflow Structures In Live Monkeys: Responses To Pressure

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Background

The principal site of pathology in glaucoma is the conventional outflow pathway.(1) Schlemm's canal pressure (SCP) is an important contributor to intraocular pressure (IOP). We describe an accurate, dynamic real-time imag-

ing technique to estimate SCP and characterize behavior of the distal outflow structures in non-human primates (NHPs). This may enhance our understanding of human glaucoma pathophysiology and help evaluate therapeutic options.

Methods

A needle, connected to a pressure transducer and computer, is placed into the anterior chamber of an anesthetized monkey to continuously record and control IOP. Concurrently, SC is imaged using a non-invasive, non-contact endoscope attached to a digital camera that is connected to a computer. The images obtained are time-synchronized with the collection of IOP data, so that the corresponding IOP is known for every frame of the video as it displays outflow pathway configuration and coloration.

Results

As IOP is lowered, SC fills with venous blood and is visible as a red band. When IOP is raised, SC narrows and blanches. These changes occur at a wider and greater IOP range than predicted (~5-22mmHg). A sausage-like appearance of the blood column within SC is observed, which may indicate segmental/regional differences or confluence with collector channels (CC). With image processing, CCs and their connections to SC are visible. Blood-tinged aqueous is seen passing through the distal connections between SC and CC in synchrony with ocular pulse. The dimensions of the CCs are notably IOP-dependent. At high IOP, CCs are distended and visible, but at low IOP are seen to undergo collapse. Subtle circumferential flow of the blood column within SC may be seen.

Conclusion

In summary, our video recording of aqueous pathway morphology while digitally recording IOP provides synchronized time stamping and a useful description of pressure-related pathway dynamics.

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P14 The Evaluation Of Retinal Microcirculation In The Predicting Of Glaucoma Progression

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Background

It has been postulated in literature that the disfunction of retinal microcirculation may lead to glaucoma development and progression (1-3).

Purpose

To study the role of circulatory ocular disorders, including retinal microcirculation, retrobulbor blood flow and the choroidal thickness in the predicting of primary open angle glaucoma (POAG) progression.

Methods

The clinical data of 85 POAG patients (85 eyes), was followed for 2 years, and analysed in the prospective study. The vascular densities of the parafoveal superficial plexus (VD parafovea), and the peripapillary retina (VD PPR) were assessed using OCT-angiography (Avanti, Optovue Inc., Fremont, CA, USA): AngioVue OCTA software revision 2016.1.0.26.). The resistance index (RI) and blood flow velocity in the posterior short ciliary arteries (PSCA), the central retinal artery (CRA) and the central retinal vein (CRV) were assessed by colour Doppler mapping.

The progression of glaucomatous optic neuropathy, was determined by means of the Guided Progression Analysis (GPA) software on the Humphrey Field Analyzer II (HFA, Carl Zeiss Meditec Inc., Dublin, CA, USA) (ROP1), and spectral domain optical coherence tomography (Avanti SD-OCT (Optovue, Inc., Fremont, CA, USA): according to the thinning of the retinal nerve fiber layer (RNFL) (ROP2) and the ganglion cell complex (GCC) (ROP3). Progression was defined at the point where a significant ($P < 0.05$) negative slope (thinning trend) was observed.

Mean ocular perfusion pressure (MOPP), was calculated from IOP and arterial blood pressure (BP) measurements, immediately before the OCT scanning and investigation of retrobulbar blood flow, after a 10-minute resting period in the sitting position. Systemic BP was measured using the Riva Rocci technique. MOPP was calculated using the formula: MOPP = (2/3 diastolic BP + 1/3 systolic BP) × 2/ 3 –IOP.

Intraocular pressure (IOP) was measured using an analyser of biomechanical properties of the eye (Ocular Response Analyzer, ORA, Reichert Ophthalmic Instruments Inc., Depew, NY, USA),

The prognostic properties of each diagnostic parameter, were calculated using the Mann-Whitney test and the area under the ROC curve (AUC).

Results

Circulatory parameters: VD parafovea (AUC 0.70 ± 0.07), VD PPR (0.715 ± 0.07), PSCA RI (0.801 ± 0.12), and CRA RI (0.798 ± 0.11) had equally high prognostic properties as IOPmax (0.79 ± 0.05), corneal hysteresis (0.755 ± 0.07) and structural parameters: thickness of the parafoveal inner layers (0.728 ± 0.07), RNFL (0.692 ± 0.06), peripapillary (0.752 ± 0.09) and subfoveal choroid (0.740 ± 0.09). The following correlations have been revealed: ROP1 with IOPmax ($r = 0.23$, $p = 0.01$), ROP2 with the end diastolic velocity in PSCA ($r = -0.23$, $p = 0.01$), VD parafovea superficial with corneal hysteresis ($r = 0.4$, $p = 0.01$), and the GCC thickness with ocular perfusion pressure ($r = 0.36$, $p = 0.01$).

The rate of loss of the peripapillary capillary network in the glaucoma progression group was three times higher

than that in the no progression group: -4.1 ± 1.0%/year and -1.4 ± 1.1%/year, respectively (p = 0.04).
While glaucoma progressed, we revealed the coincidence of VF defects, peripapillary VD drop-out and RNFL thinning in the same clusters as it shown in Fig.1.

Conclusion

The obtained data demonstrates the role of circulatory disorders in POAG progression and the ability of OCTA in its predicting.

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P15 Time Domain Functional Near-Infrared Spectroscopy (Td F-Nirs) On Visual Cortex Evaluation And Electrofunctional Response (Pattern Erg And Visual Evoked Potent)

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Background

Glaucoma is a multifactorial optic neuropathy characterized by a progressive loss of retinal ganglion cells. In experimental and in human studies degenerative changes in the brain involving the intracranial optic nerve, the lateral geniculate nucleus and the visual cortex have been found (1,2,3,4). Functional near infrared spectroscopy (fNIRS) is a non-invasive optical technique that allow to detect the variation in haemoglobin concentration in visual cortex after visual stimulation (in this study) resulting from neural activation (neurovascular coupling). Pattern Electroretinogram (PERG) is a director indicator of functionality of retinal ganglion cells. It has high sensitivity in detecting ganglion cells dysfunctionality and is abnormal in most glaucomatous patients (5,6), also in normal tension glaucoma (7). Visual Evoked Potentials (VEPs) assess the integrity of the visual pathways up to the occipital cortex.

Methods

The aim fo this study is to analyse the morpho-functional response of 26 (11 F, 15 M) open angle glaucomatous (OAG), and 17 (5 F, 12 M) ocular hypertension subjects (HYPER) at different levels compared to a 22 normal (12 F, 10 M) control group subjects (NORMAL), aged between 45 and 79; NORM: 64.95±7.48 years; GLAUCOMA: 65.65±8.71; HYPER: 67.23±9.71
All subjects underwent visual acuity, Goldmann applanation tonometry, computerized visual field (G2 program, Octopus perimeter), OCT (RNFL and macular ganglion cell thickness), transient Pattern electroretinogram (PERG) and Visual Evoked Potentials (VEPs).
Time Domain -fNIRS is a non-invasive optical technique that employs two picosecond diode pulsed lasers (687 nm and 826 nm) that reach occipital area (about to a depth of 3 cm) in OZ (10-20 EEG system) by means optical fibres: here they can be absorbed or diffused by law of Lambert-Beer. The detection optodes are located 3 cm laterally to the source (in O1 and O2). After a presentation cycle of alternating checkboard of high contrast and a gray screen it is possible to calculate the variation concentration of Oxy- (OHB) and deoxy- (HHB) haemoglobin in two measurement points for each hemisphere (8,9,10).

Results

In fig 1 and 2 we can see a typical example of the time course coming from a control (fig 1) and a glaucomatous patient (Fig 2). The five grey background refer to the periods where the checkboard war shown to the subject, while white ones are the rest periods. Thin lines are the raw data (red: OHB, blue HHB), while thick one are the fit with haemodinamic response function (HRF) outcome (10). The average (and standard deviation(amplitude (A) and delay (tau) in the activation thicker line were calculated:
NORM: AOHB =0.72±0.46, AHHB = -0.23±0.16, τau OHB =4.89±1.47, τau HHB =5.90 ±3.02;
GLAUCOMA: AOHB=0.36±0.55, AHHB=-0.13 ±0.18, τau OHB =4.77±2.54, τau HHB =5.63±2.79;
HYPER: AOHB=0.72±0.55, AHHB=-0.20 ± 0.18, τau OHB =4.78±2.14, τau HHB =5.69±2.35;
A two-sample Smirnov test was applied to compare these parameter for the 3 subjects groups (p-value threshold set at 0.05):
NORM vs GLAUCOMA: AOHB 5.09 · 10-7; AHHB 3.16 ·10-4; tau OHB 0.06; tau HHB 0.11;
NORM vs HYPER: AOHB 0.24; AHHB 0.40; tau OHB 0.32; tau HHB 0.82;
HYPER vs GLAUCOMA: AOHB 4.15 ·10-4; AHHB 0.10; tau OHB 0.19; tau HHB 0.28
The amplitude of both haemodynamic parameters seems to be a good indicator of the differences between normal

subject and open glaucoma patient, and only OHB underlines differences between ocular hypertension subjects and normal ones, while non significant differences were found between amplitude of normal and hypertensive ones. Tau parameter seems not to be a good indicator to evaluate difference among the groups, instead.

Regarding the other variables, MD index versus OHB variations, the test for the correlation using the coefficient of Spearman was done, since MD is not normally distributed in our sample. This preliminary analysis was performed with IBM SPSS Statistics software. Neither significant neither strong correlation was found neither in the whole sample nor considering the 3 groups alone. If considering the one-tail significance, p value for the correlation was 0,035 but the correlation wasn't strong (weak inverse correlation -0,23, one-tail p-value=0,035).

This might mean that there is actually no linear correlation between MD and NIRS (OHB changes) and therefore that the NIRS parameters vary in a different way compared to the visual field parameters.

In order to consider the possible correlation between VEP amplitudes at 30' and 15' and OHB variations and between PERG amplitudes and O2HB variation, the normality of these variables was studied: in our sample only PERG amplitudes and VEP 15' amplitude were found to be normally distributed so for the time being we chose to test the correlations with non-parametric tests. This choice might be reconsidered during further analysis and study of the data.

At this stage of the study, no significant correlation was found between the electrophysiological amplitudes parameters and OHB changes neither in the whole sample neither considering one group at a time.

Conclusion

The amplitude of both haemodynamic parameters seems to be a good indicator of the differences between normal subject and open glaucoma patient, and only OHB underlines differences between ocular hypertension subjects and normal ones, while non significant differences were found between amplitude of normal and hypertensive ones. Tau parameter seems not to be a good indicator to evaluate difference among the groups, instead.

At this stage of the study, no significant correlation was found between the electrophysiological amplitudes parameters and OHB changes.

Statistical analysis of the other parameters is still ongoing and not yet available

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P16 Changes In Oct Angles With Pilocarpine Drop Help To Choose Patients For Yag Iridotomy With More Reliability Without Bias

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Background

Gonioscopy is known for subjectivity with variable agreement. Selecting cases for PI in PACS is not free from personal bias. Substantial increase in angles before and after pilo, can offer a documentable indication for PI, thus increasing confidence.

Methods

Selecting patients for iridotomies is conjectural in borderline PACS cases. Change in angle in OCT (pre vs post-pilo) could evaluate those cases with objective quantification. Missing them to treat, we might lose their sights.
A prospective observational study to use changes in SD-OCT angles with pilocarpine drop to select cases for PIs. Sample size 152. Divided into two groups- LACD >0.5 or ≤ 0.5. OCT done before, after pilo, and after PI. Cut off value was SD-OCT Angle ≤ 200 and / or increase after Pilo is > 50%.

Results

Average change in angle in suspected cases 8.020 (183.5%; p-value 0.05).

Conclusion

Post-pilo Angle widening can reduce ambiguity or personal bias in selecting LPI cases. Our study is probably first such observation. Patients who advised LPI but not done, will be studied as cohort for long-term angle change.

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P17 Intermediate Results of iStent injects Implantation Combined with Cataract Surgery

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Background

The aim of our real world, clinical study was to assess
a) reduction of Intra-ocular pressure (IOP) after combined phacoemulsification with iStent Injects in patients with coexisting cataract & primary open angle glaucoma (POAG) and
b) reduction in glaucoma medications following surgery.
Safety outcomes included adverse events and secondary surgeries.
Prospective, non-comparative, uncontrolled, non-randomised, interventional case series study in patients with uncontrolled mild or moderate POAG on maximally tolerated medical therapy.
All procedures were performed by one surgeon (MN) at Pontefract General Hospital, Department of Ophthalmology, Mid Yorkshire Hospitals Trust, United Kingdom.

Methods

45 eyes (35 patients) with visually significant cataract & uncontrolled POAG underwent surgery. Mean group age was 76.10 years (55-90 years) and 51.02% were male and 30.61% female.
53.06% patients were uncontrolled on glaucoma medications and 42.85% were non tolerant to glaucoma medications. All patients underwent uneventful phacoemulsification with IOL implant + iStent Injects.
Postoperative follow-up visits were planned at Day 1, Week 1 & Months 1, 3, 6, 9 and 12.
24.48% of patients were on systemic Acetazolamide

which was discontinued on the day of surgery and the remaining ocular hypotensive medications were gradually washed off during postoperative visits depending on the IOP reduction.
A Patient Satisfaction Survey was also conducted and results are quite promising.

Results

Mean IOP reduction from baseline was 5.37 mmHg (23.4%) at Day 1, 33.9% at Month 6, 28.6% at Month 9 and 25.7% at Month 12. The number of ocular hypotensive medications were reduced from 2.55 drops at baseline to 1.5 at Month 1 and to 1.18 drops at Month 12 (53.7% reduction).
83.2% of patients had significant IOP reduction and in 76% of patients, the number of drops was reduced following surgery.
Post-operative adverse effects were minimal with rapid post-operative recovery. Subjectively, patients confirmed these results with their answers in the Satisfaction Survey. Most of them appreciated improved vision and reduction in glaucoma medication.

Conclusion

IOP reduction was clinically and statistically significant: mean IOP reduction of more than 25% was achieved at month 12 along with 50% reduction in glaucoma drops. These findings are achieved in a real world clinical setting and outcomes are favourable. Meaningful reduction in IOP and glaucoma drops was achieved with minimal adverse effects. Minimally invasive Glaucoma Surgery (MIGS) such as iStent are gradually gaining popularity. It is safe and effective in reducing IOP whilst also reducing glaucoma drops. Although long term follow-up and a larger patient group is required, early to intermediate results are encouraging..

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P18 Integrated Pilot Medical Study On 40 Patients Affected By Open Angle Glaucoma Undergoing Topical Therapy With Additional Osteopathic Manipulation

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Background

Malfunction of the lymphatic or glymphatic system recently shown in the brain, seems to play an important role in central neurodegenerative pathologies through a build-up of neurotoxins. Recent studies have shown functional links between aqueous humour and cerebrospinal fluid via the glymphatic system, offering new perspectives and unifying theories on the vascular, biomechanical and biochemical causes of chronic and open-angle glaucoma (POAG). The aim of this randomized pilot study is to compare the variations in intraocular pressure between 20 cases of compensated POAG under pharmacological therapy and 20 glaucoma patients undergoing osteopathic treatment, hypothesizing that this manipulation can influence intraocular pressure.

Methods

The 40 patients under study, all covered by the Helsinki convention, were randomly divided into 2 groups (treated group or TG and control group or CG). The 40 patients were chosen from compensated glaucoma sufferers, who required neither changes in therapy nor operations which would affect their eye pressure which was measured both before and after manipulative osteopathic treatment scheduled into 4 sessions at intervals of 7.3 and 150 days, then compared with the control group (20 patients) who were undergoing pharmacological treatment only.

Results

The average IOP in the TG was compared with the CG throughout the entire treatment cycle showing a statistically inconclusive reduction in the right eye
RE P-value (0.0561), while for the left eye a significant effect was shown LE (0.0073). The difference between the reduction in IOP between TG and CG was observable 10 months after the first session or rather 5 months after the last, and demonstrable during a check-up 13 months after the beginning of the study, or rather 8 months in absence of treatment with a highly significant statistical P-value (0.000434).

Conclusion

This study has shown that manipulative osteopathic treatment can affect intraocular pressure after each session and that the pressure is significantly lower even months after the last treatment session.

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P19 UBM Imaging Patterns In Successful Trabeculectomy With Suprachoroidal Derivation. A Long Term Analysis

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Background

To describe common imaging patterns at surgical area of operated glaucomatous eyes with a successful result at 24 months follow-up or more. The surgical technique (trabeculectomy with suprachoroidal derivation -TREC w/ SCD-) has been previously described.[1]

Methods

This prospective, observational series of consecutive cases was conducted at the Cataract and Glaucoma Institute of Lima, Peru. A VuMax (Sonomed Escalon, NY, USA) UBM device was used to obtain radial scans through the central axis of the surgical area. Inclusion criteria: every successful TREC w/ SCD performed at the clinic between January 2012 and December 2015 and reaching the required follow-up time. Success was defined as an IOP of 18mmHg or less and an IOP reduction of 20% or more at the final control. Exclusion criteria: eyes that failed to reach the mentioned aim, an IOP of 5mmHg or less, reoperation, devastating complications, loss of light perception, patients not complying with follow-up controls, studies with low quality images. Every scan was taken by the same observer (RPG). Presence / absence of a conjunctival filtering bleb, presence and size of a suprachoroidal chamber (size classified according to radial diameter as none (0mm), limited (1-4mm) and extensive (>4mm), presence of choroidal detachments, and any additional sign were analyzed by an independent observer (DG). Only images obtained at the last control were considered.

Results

Eighteen eyes of 14 patients were included. At the last control the follow-up time had been 42,94 months (median 47 months), the average IOP 12.66±2.49mmHg (median 13mmHg), and the reduction from basal value had been 42.60%±22% (median 45.8%). UBM findings: a) one third of the eyes (6) had no ultrasonographic evidence of an external bleb[2], b) eighty eight percent (16) had an evident suprachoroidal anechoic space. In 63.5% of these, the space was classified as extensive c) an additional sign was found in five eyes (27%): a hypoechoic ciliochoroidal area inside the ciliochoroidal complex. No choroidal detachments or other signs that may also influence IOP levels were found.

Conclusion

Eyes with TREC w/ SCD achieving success at a long term maintain UBM patterns compatible with different aqueous exit routes.

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P20 Trabeculectomy with Suprachoroidal Derivation: 2 year Follow up.

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Purpose

To evaluate the effectiveness of a novel glaucoma surgery in patients with refractory glaucoma.

Design

Prospective uncontrolled non-randomized case series.

Methods

Prior approval from our institutional review board has been granted and informed consent has been obtained from each patient. The study included the 31 eyes of 27 patients who underwent trabeculectomy with Mitomycin C and suprachoroidal derivation with 2 autologous scleral flaps.

Results

The mean pre-operative intraocular pressure was 23.23 ± 8.61 mmHg and the mean number of pre-operative glaucoma medications was 3.13 ± 1.31. At one day post-operatively, intraocular pressure had decreased a mean of 13.48 mmHg, at 1 month 11.27 mmHg, at 3 months 11.97 mmHg, at 6 months 11.58 mmHg, at 12 months 11.45 mmHg, at 18 months 11.16 and at 24 months 11.29 mmHg. The mean number of post-operative glaucoma medications was 0.42 ± 0.96. No severe complications were found.

Conclusion

This novel procedure achieved a statistically significant reduction of the intraocular pressure after 24 months of follow-up. It is an effective and safe surgical technique.

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P21 Clinical Multicenter Study Of Trabeculectomy Efficacy

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Background

To study the clinical and epidemiological characteristics of primary open-angle glaucoma (POAG) development and progression in patients who underwent trabeculectomy.

Methods

The results of complex clinical assessment and treatment of 184 patients (203 eyes) with different POAG stages were analyzed. Medical history, ocular status, IOP-lowering medication use, concomitant disease, early and long-term trabeculectomy results were assessed.

Results

Mean duration of POAG from the diagnosis to the endpoint visit was 5.39±4.87 years (min. 6 months, max. 34 years). The duration of the disease in patients with early glaucoma-changes was 7.2±3.8 years, in patients with moderate glaucoma-changes – 6.5±5.95 years, in patients with advanced glaucoma-changes – 3.8±3.6 years. Mean duration of POAG at the time of the surgical procedure was 2.5±3.02 years. The follow-up period was 2.97±3.93 years. Moderate and advanced glaucoma-changes were found in 83.3% of patients at the diagnosis; at the end of the study these changes were found in more – 86.2% of patients ($p<0.05$). Main indications for the procedure were: increased IOP level – 58.62%.

Conclusion

More than a half of operated patients (50.74%) do not need to use IOP-lowering medications in a follow-up period of 2.97±3.93 years. Glaucoma surgery is an effective method of treatment that can slow down glaucoma progression.

P22 Unique Properties And 2-Year Pooled Outcomes Of The PRESERFLO® Microshunt In Patients With Primary Open-Angle Glaucoma

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Background

The PRESERFLO® MicroShunt (formerly known as the InnFocus MicroShunt®) is an 8.5-mm-long (internal lumen diameter 70 µm; outer diameter 350 µm) subconjunctival/Tenon's capsule glaucoma drainage device, which received a Conformité Européenne (CE) mark in 2012. The MicroShunt is made from poly(styrene block isobutylene block styrene) (SIBS), a highly biocompatible, bioinert, soft and flexible material which allows it to conform to the shape of the eye. The lumen size prevents clogging yet is sufficiently small to enable controlled flow of the aqueous humour, thereby minimising hypotony. Leakage and device migration are prevented by a 1.1-mm fin located halfway down the tube. Ab externo MicroShunt implantation enables precise control of placement and haemostasis without the need for a gonioscope, suture tension control, iridectomy, sclerectomy or suture lysis. Sub Tenon's placement of the MicroShunt allows controlled aqueous humour outflow from the anterior chamber to a posterior diffuse bleb (Pinchuk *et al.* 2017). A pooled analysis of three studies was conducted to assess the effectiveness and safety of the MicroShunt in patients with primary open-angle glaucoma.

Methods

Three prospective, single-arm studies, conducted across sites in Europe and the Dominican Republic, enrolled patients with glaucoma inadequately controlled on maximum tolerated medical therapy with medicated intraocular pressure (IOP) ≥18 mmHg and ≤40 mmHg. Two-year outcomes included medicated IOP, glaucoma medication use and adverse events (AEs). The per-protocol population was used for this analysis; data collected after reoperation were excluded.

Results

The MicroShunt was implanted in 125 patients; 12 discontinued by Year 2. Mean ± standard deviation (SD) and median (interquartile range [IQR]) IOP was reduced from 22.4±4.2 mmHg and 21.0 (6.0) mmHg at baseline to 13.8±4.0 and 13.5 (5.0) mmHg at Year 2, respectively (change: –8.9, –8.0 mmHg). Number of glaucoma medications was reduced from 2.2±1.3 and 2.0 (2.0) to 0.5±0.9 and 0.0 (1.0) (change: –1.7, –2.0). Commonly reported AEs (≥5%) included increased IOP (27.2%), transient hypotony (IOP <6 mmHg at any time; 13.6%), keratitis (10.4%) and hyphaema (9.6%). No long-term sight-threatening AEs were reported. By Year 2, 14 patients had undergone glaucoma reoperation.

Conclusion

Results from these studies have demonstrated a reduction in IOP and glaucoma medications from baseline up to 2 years post MicroShunt implantation. The unique properties and minimally invasive nature of the MicroShunt may present an alternative to trabeculectomy. A clinical study assessing the safety and effectiveness of the MicroShunt compared with trabeculectomy is currently ongoing.

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P23 Glaucoma And Cerebral Blood Flow Autoregulation: Pilot Study

Lina Siaudvytyte*[1], Vytautas Petkus[2], Ingrida Januleviciene[3], Alon Harris[4], Arminas Ragauskas[5]

[1]Department of Ophthalmology, Lithuanian University of Health Sciences, Lithuania; [2]Health Telematics Science Institute, Kaunas University of Technology, Lithuania; [3]Department of Ophthalmology, Lithuanian University of Health Sciences, Lithuania; [4]Glaucoma Research and Diagnostic Center, Eugene and Marilyn Glick Eye Institute, Indiana University School of Medicine, Indianapolis, IN, USA; [5]Health Telematics Science Institute, Kaunas University of Technology, Lithuania

Background

Glaucoma is a leading cause of irreversible blindness worldwide. Although high tension glaucoma (HTG) is associated with increased intraocular pressure, the causes of normal tension glaucoma (NTG) are controversial. We hypothesized that NTG can be related with disturbed cerebral blood flow, therefore, our objective was to explore cerebrovascular autoregulation (CA) status in glaucoma patients.

Methods

Prospective pilot study of non-invasive CA monitoring included 10 NTG patients, 8 HTG patients and 10 volunteers in control group. All participants were 63-80 years old. CA status was monitored by using non-invasive ultrasonic CA monitoring technology based on intracranial blood volume (IBV) and arterial blood pressure (ABP) slow wave measurement.

Real-time recording of volumetric reactivity index (VRx-(t)) was used in order to identify dynamics of CA changes. VRx(t) reflects a time dependence of a phase shift between non-invasively measured IBV(t) and ABP(t) slow waves.

Results

Mean values of VRx(t) and SD were as follows: control group mVRx=-0.179, SD=0.22; NTG group mVRx=0.056, SD =0.168 and HTG group mVRx=-0.070, SD =0.249 (Fig.1). Statistically significant differences were found in comparing mVRx indexes as well as duration of longest CA impairment events in NTG and control group (Mann-Whitney U tests P=0.025 and P=0.007, respectively). However, these differences were not statistically significant in HTG and control group.

Conclusion

It has been shown by using this non-invasive technology, that CA status is deteriorated in NTG patients and that mean VRx(t) values are statistically significantly different comparing NTG and control groups (Fig. 1). We didn't find statistically significant difference between HTG and control groups.

P24 Assessing Glaucoma Progression Solely Based Upon Independent Analysis Of IOP, HVF, And OCT Results

Richard Ten Hulzen*[1], Ariel Chaves[1], Renata Prota Hussein[1], Oshin Rai[1], Syril Dorairaj[1]

[1]Department of Ophthalmology, Mayo Clinic Florida, Jacksonville, FL, USA

Background

Worldwide, the glaucoma population likely will double by the year 2040 without a commensurate increase in the population of glaucoma specialists in the USA1. To ensure the continued convenience, successful screening, and access to glaucoma specialists for every glaucoma patient, we explored strategies towards developing a team-based care model. For this model to work, the care team would need to accurately agree upon a glaucoma diagnosis to prompt a referral to a glaucoma specialist. Unlike screening for diabetic retinopathy, which may utilize a single imaging modality, the successful screening for glaucoma seemingly requires the aggregate consideration of multiple imaging and ancillary testing modalities to make an accurate diagnosis. Yet, all modalities may not be available in resource-poor situations for screening underserved, yet high-risk, populations. Our study evaluated the interrater agreement of glaucoma progression solely on the basis of three isolated sets of data—namely intraocular pressure (IOP) readings, Humphrey Visual Field (HVF) reports, and ocular coherence tomography (OCT) reports—and in the absence of any additional clinical context (such as patient history, exam findings, or disc photos).

Methods

This study is an IRB-approved retrospective review of chart data on 46 patients. All patients were examined by the same glaucoma specialist (SKD) who determined that they all were suspicious of glaucoma progression in at least one eye. Three sets of data were excerpted from the electronic medical records (EMR) and de-identified: Intraocular pressure (IOP) readings, Humphrey Visual Field (HVF) reports, and OCT reports. Humphrey Visual Fields (Zeiss/Humphrey, San Leandro, CA) utilizing the 24-2 SITA program (Swedish Interactive Threshold Algorithm, software version 5.1.1 or 5.1.2) were used; no glaucoma progression analysis (GPA) software was used. HD-OCTs were performed on 1 of 2 machines—Cirrus 4000 (Carl Zeiss Meditec, Dublin, CA, software version: 6.5.0.772 or 9.5.2.19038) or the Spectralis (Heidelberg Engineering, Heidelberg, Germany, software version 5.8.3); no GPA software was used for either HD-OCT machine. Six masked reviewers (2 glaucoma specialists, 2 general ophthalmologists, and 2 optometrists) were independently asked to determine, solely on the basis of each specific class of examination data (e.g., IOP, OCT and visual fields), as to whether or not they believed glaucoma to be progressing for each patient. The examining glaucoma specialist (SKD) was not one of the six reviewers.

Assessment of Glaucoma Progression: Each of the 6 masked reviewers were asked to read a set of exam findings (IOP, VFs and OCTs) for each eye and determine whether or not each data class indicated glaucoma progression or not. To simulate real-world situations, the reviewers were not given a definition of glaucoma "progression" and each reviewer used whatever definition of "progression" he or she deemed appropriate. A binary variable (progression vs. no progression) was chosen for 2 reasons related to preserving statistical strength. First, unless a weighted-κ is used, κ will not reflect the degree of disagreement. If an intermediate category of "possible progression" had been added, the degree of disagreement between no progression versus possible progression would be smaller than the degree of disagreement between no progression and definite progression. Second, we recognized that a category of possible progression would introduce a potential source of confusion among different raters. The consensus in assessment of glaucoma progression by both glaucoma specialists was considered to be the gold standard against which the judgments of progression by the general ophthalmologists and the optometrists were compared. If it were determined that the two masked glaucoma specialist reviewers disagreed regarding progression, then the determination of the original glaucoma specialist (SKD), who had actually examined the patients, would determine the correct response. All assessments were recorded in REDCap (Research Electronic Data Capture)—a secure web application for building and managing online surveys and databases.

Results

General characteristics of the 46 enrolled patients (90 eyes) are shown in Table 1. A total of 90 eyes were evaluated for IOP and OCT, and 88 eyes were evaluated for VF. Interrater agreement ranged from poor to moderate. For the eyes reviewed, glaucoma specialists and optometrists were in complete agreement regarding glaucoma

progression (or not) in only 49 eyes, or 54.4%, for OCT, in only 32 eyes, or 37.2%, for VFs, and in 31 eyes, or 34.4% for IOP. For the eyes reviewed, the two glaucoma specialist reviewers agreed upon glaucoma progression for 84.44% (4 yes, 72 no) of eyes when using OCT, and 73.86% (7 yes, 58 no) of eyes when using VFs, and 73.33 % (no 66) of the eyes when using IOP. The two general ophthalmologists agreed upon glaucoma progression (or not) in 71.11% (7 yes, 57 no), 48.86% (9 yes, 34 no), and 54.44% (10 yes, 39 no) of the total eyes reviewed for OCT, VF, and IOP respectively. The two optometrists agreed upon glaucoma progression (or not) in 67.78% (8 yes, 53 no); 78.41% (41 yes, 28 no) and 61.11% (21 yes, 34 no) of the total eyes reviewed for OCT, VF, and IOP respectively. Comparison of general ophthalmologists and optometrists assessments against glaucoma specialists assessments are summarized in Table 2.

Conclusion

Generally, kappa values (k) ranging from 0-0.2 indicate slight to no agreement, from 0.21-0.4 fair agreement, from 0.41-0.6 moderate agreement, from 0.61-0.8 substantial agreement, and from 0.81-1.0 near perfect agreement. Alternatively, kappa values below 0.60 indicate inadequate agreement among the raters and little confidence should be placed in the study results. In this study, interrater agreement ranged from slight to fair for all groups for all types of data, with only one exception: optometrists achieved moderate interrater agreement levels (k = 0.561) on visual fields alone. The poor agreement between reviewers in this study is believed, in part, to be due to lack of clinical context to help guide determination of progression by reviewers.

Another reason for poor agreement between reviewers includes different approaches towards test interpretation by each reviewer. For example, while both glaucoma specialists agreed that IOP is an important and modifiable risk factor for glaucoma progression, one of the glaucoma specialists did not consider IOP (particularly increased IOP, or IOP increasing over time) to be a determinant of "progression," and, accordingly, marked "no progression" for all IOP results regardless of value. These findings suggest that, even within the same institution, considerable interrater variability (i.e., disagreement) exists when data sets are reviewed in isolation rather than as part of a whole, or when different reviewers apply different definitions towards grading.

A previously published study by Shah assessed glaucoma progression via review of an aggregate set of exams (with data including IOP, VF, OCT, and disc photos) and showed agreement between glaucoma specialists of 78.7% (k=0.39) and between optometrists 74.2% (k=0.42).3 This study differs in that it asks reviewers to assess glaucoma progression solely based upon the isolated analysis of IOP, HVF, and OCT data set results independently of other data. Clinically, data interpretation does not occur in a masked fashion, rather it is considered along with other patient history and exam findings and modalities not included in this study—for example, optic nerve photos. A recent study found that artificial intelligence (AI) has an interrater agreement with the gold standard of k = 0.715 while the best scoring ophthalmologist in the study had k = 0.6133.4 The poor interrater agreement (low kappa values) in this study shows that determining glaucoma progression in an individual patient solely based upon independent analysis of IOP, HVF, and OCT results is not optimal. This may have implications for future research involving teleglaucoma, artificial intelligence, machine learning, and deep intelligence, all which involve reviewer-based biases, which may impact developing glaucoma care-team programs and potentially affect the success of those programs.

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P25 Beta Zone Of Parapapillary Atrophy And Zinn-Haller Arterial Ring Vessels By Optical Coherence Tomography As Biomarkers Of Glaucoma Associated With Myopia

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Background

To evaluate changes of parapapillary atrophy and Zinn-Haller vessels in the glaucoma diagnosis associated with myopia by OCT-angiography.

Methods

Patients with clinically advanced primary open-angle glaucoma in eyes with high myopia (26 eyes) and people with uncomplicated myopia (30 eyes) were enrolled into

the study. All patients were scanned with a 70-kHz spectral-domain OCT system using the split-spectrum amplitude-decorrelation angiography (SSADA) algorithm to visualize Zinn-Haller vessels in the parapapillary atrophy area.

Results

A reduction in the rim area (1.03±0.36 and 1.6±0.42; p=0.05) in glaucoma is related to the choroid thinning, mainly in the lower (131.36±41.98 and 226,5±98.13; p=0.01) and nasal (57.63±9.81 and 216±122.4; p=0.0006) segments and is accompanied by the increase in the area of the parapapillary atrophy (1.94±0,5 and 1.05±0.15; p=0.005), which indicates the inconsistency of trophic and metabolic processes.

Gamma zone was identified in myopia (fig. 1). Along with the gamma zone, the beta zone was visualized in myopia and glaucoma (fig. 2). In glaucoma, there was a decrease in the density of small branches going towards the optic nerve head and participating in the blood supply of its pre-laminar part and the lamina cribrosa. Between choriocapillaris and optic disc, zones of nonperfusion were revealed. As glaucoma progresses, symptoms increase up to complete obliteration of small branches (fig. 3).

Conclusion

The presence of beta-zone, the reduction in the density of capillaries involved in the blood flow to the optic disc, the exposure of large vessels of the Zinn-Haller arterial circle with the formation of nonperfusion zones can be differential diagnostic criteria of glaucoma associated with myopia and can be used for pathological process monitoring.

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Spiegelgracht
Rijksmuseum
Insulindeweg
Lijnbaansgracht
Heineken Experience
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Oosterpark Amsterdam
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OOSTPOORT
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Amstelpark
APGS Amsterdam

General

Info Rosarium & Amstelpark

The congress will be hosted at Rosarium, located in the beautiful Amstelpark in Amsterdam.

The Amstelpark was built and opened for the 1972 Floriade gardening exhibition. The park has its own train line, the Amstel train, which runs through the Rosarium, the rhododendron valley and the Riekermolen.

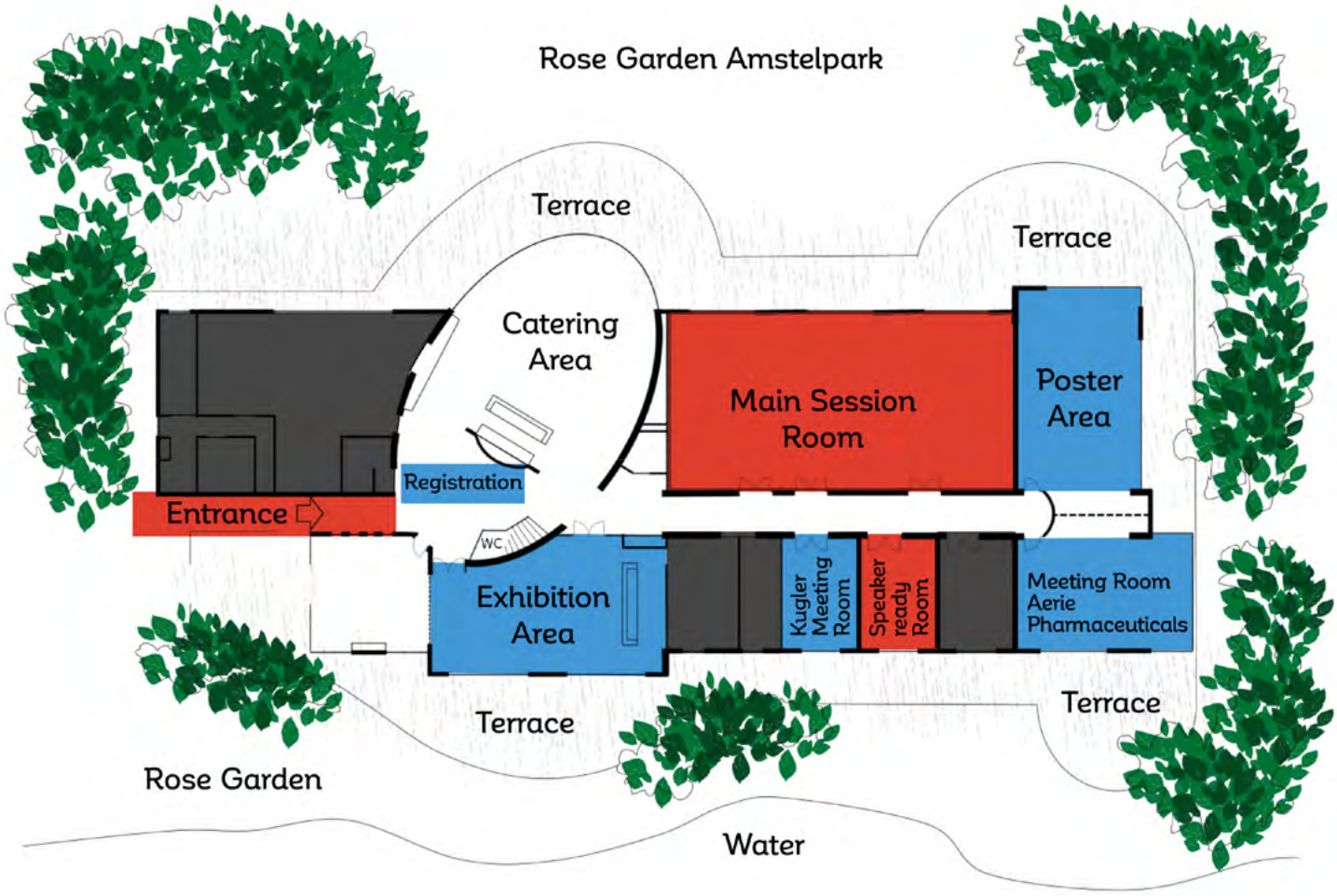
How To Get There

The Rosarium is located along the A10 highway and has sufficient (paid) parking. It's also located within walking distance from RAI station.

It will take approximately 15 minutes by train, tram or metro to get to either Amsterdam's city center or Schiphol Airport.

There are plenty of other public transport options available close to the RAI. Other good recommended transportation options are renting a bike, taking an Uber/taxi.

Floor Plan



Rooms

- **Ambassador** - **Poster Area** - See page 11 for opening hours.
- **Parade** - **Kugler Publications Meeting HQ** - Kugler and meeting staff office during the meeting.
- **Prominent** - **Aerie Pharmaceuticals meeting room** - Aerie's meeting room, access on their invitation only.
- **Montana** - **General meeting room** - Open to all participants to hang out.

Language

The official language of the congress is English.

Registration Desk

The registration desk also serves as an information desk. You are more than welcome to visit us here for information about things to do in Amsterdam, assistance with booking a tour or any other questions you may have.

Registration desk opening hours:

Wednesday	16:00–20:00
Thursday	07:30–20:00
Friday	08:00–17:30
Saturday	08:00–17:30

Contact Us During The Meeting

Email us at info@glaucomaconcepts.com
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For more information on our cancellations/refunds terms please visit our website: www.glaucomaconcepts.com/congress/terms.

Badges

All participants and accompanying persons will receive a personal badge upon registration. You are kindly requested to wear your name badge when attending any presentation or network gathering. Only participants who are wearing their name badge will be admitted to the meeting rooms. You should also wear your badge in the Exhibition Area.

Name badges have been categorized as followed:

- Faculty - Blue
- Participants - Grey
- Exhibitors - Yellow
- Kugler Publications/Staff - Red
- Accompanying person - White

Catering

Complimentary coffee & tea and lunch will be provided in the catering area on all congress days to all congress registrants during the breaks.

On Thursday evening there will be a free welcome reception in the catering area.

Lost And Found

A lost and found is located at the registration desk.

WiFi

There is free WiFi available within the venue.

You can connect to: **GlaucomaConcepts2019**. No password is needed.

For Friday's social program we are offering several tours. For example tour 2: Van Gogh Museum Tour. See page 12 for more information.

Things to see in Amsterdam

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Aerie is an ophthalmic pharmaceutical company focused on the discovery, development and commercialization of first-in-class therapies for the treatment of patients with open-angle glaucoma, retinal diseases and other diseases of the eye. In the U.S., Aerie developed and markets Rhopressa® (netarsudil ophthalmic solution) 0.02%, a Rho kinase (ROCK) inhibitor, and the fixed-dose combination Rocklatan® (netarsudil and latanoprost ophthalmic solution) 0.02%/0.005%. Aerie has established development operations in Europe and Japan and a global manufacturing facility in Ireland. Aerie is expanding its ophthalmic pipeline with two clinical-stage retina programs in the U.S. and exploration of its proprietary library of small-molecule multi-kinase inhibitors. Visit Aerie online at www.aeriepharma.com.

Aerie is providing an unrestricted education grant to the Advances in Glaucoma Research and Clinical Science Meeting 2019.

Bronze Level

Santen

As a specialized company dedicated exclusively to ophthalmology, Santen carries out research, development, marketing, and sales of pharmaceuticals, OTC eye care products, and medical devices. Santen is the market leader for prescription ophthalmic pharmaceuticals in Japan and its products now reach patients in over 60 countries. With scientific knowledge and organizational capabilities nurtured over a nearly 130-year history, Santen provides products and services that contribute to the well-being of patients, their loved ones and consequently to society.

Santen is providing an unrestricted education grant to the Advances in Glaucoma Research and Clinical Science Meeting 2019.

Exhibitors

AerieAerie Pharmaceuticals - Tables 6+7

Aerie is an ophthalmic pharmaceutical company focused on the discovery, development and commercialization of first-in-class therapies for the treatment of patients with open-angle glaucoma, retinal diseases and other diseases of the eye. In the U.S., Aerie developed and markets Rhopressa® (netarsudil ophthalmic solution) 0.02%, a Rho kinase (ROCK) inhibitor, and the fixed-dose combination Rocklatan® (netarsudil and latanoprost ophthalmic solution) 0.02%/0.005%. Aerie has established development operations in Europe and Japan and a global manufacturing facility in Ireland. Aerie is expanding its ophthalmic pipeline with two clinical-stage retina programs in the U.S. and exploration of its proprietary library of small-molecule multi-kinase inhibitors.

Kugler Publications - Tables 1+2

Kugler Publications(est. 1974) is an independent publishing company specialized in Oto-Rhino-Laryngology, Ophthalmology, and related fields. Kugler has built a rich experience and solid reputation in publishing books, journals, proceedings and other publications; both in print and electronic. Here at Kugler Publications we aim to keep Simon Kugler's warm personal touch, and way of doing business based on trust, friendship and long lasting relations incorporated into our everyday company culture. Drop by our booth to browse our publications or discuss your publications ideas.

VISUfarma - Table 5

VISUfarma is a pan-European ophthalmic pharmaceutical company with a clear mission: to bring quality products and global therapeutic innovation to European eye health. Formed in 2016, we are an ambitious and fast growing ophthalmology company, commercialising a broad portfolio of pharmaceutical products and medical devices across Europe and in 20+ countries worldwide through exclusive distributors. We offer a complete portfolio of products in the areas of dry eye, eyelid hygiene, meibomian gland dysfunction(MGD), blepharitis & demodex management, retinal health & food supplements and glaucoma.

World Glaucoma Association/World Glaucoma Congress - Table 3

The World Glaucoma Association (WGA) is an independent, impartial, ethical, global organization for glaucoma science and care. WGA's core purpose is to eliminate glaucoma-related disability worldwide. The WGA is the largest international glaucoma association, encompassing a network of 89 Glaucoma Societies worldwide with over 12,000 individual members.

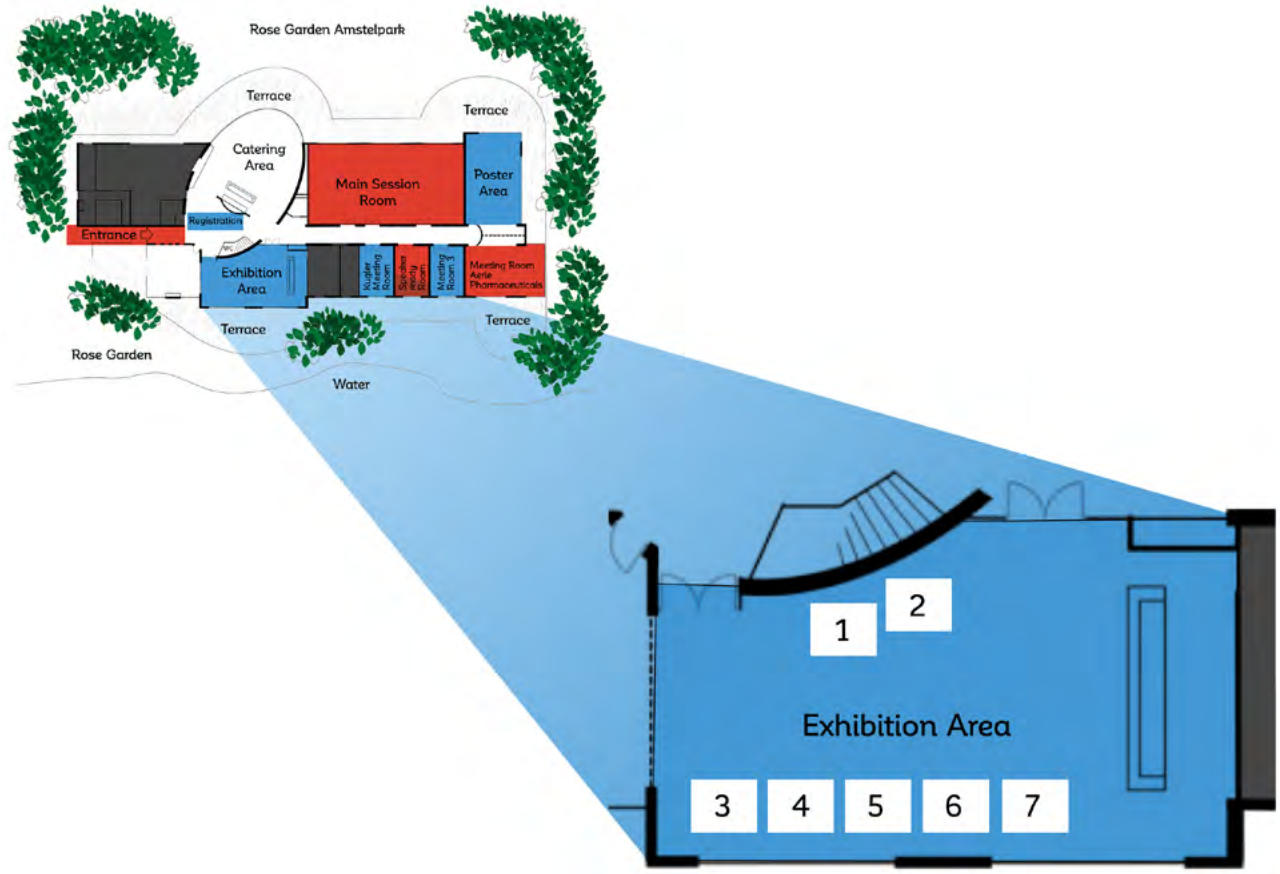
World Ophthalmology Congress- Table 4

Join us 26–29 June 2020, in Cape Town, South Africa, at the Cape Town International Convention Centre for the 37th World Ophthalmology Congress® (WOC) of the International Council of Ophthalmology, the premier and largest international ophthalmic congress, with over 10,000 delegates expected to attend from over 110 countries.

Registration for exhibitors opening hours	
Wednesday	**16:00–20:00**
Thursday	**07:00–20:00**
Friday	**07:00–17:30**
Saturday	**08:00–17:30**

Please show us your picture id when collecting your badge

Exhibition Area Floor Plan



Exhibition Opening Hours

Table top setup for exhibitors	
Wednesday	**16:00–20:00**
Thursday	**07:30–09:30**
Exhibition opening hours	
Thursday	**10:00–20:00**
Friday	**08:00–17:30**
Saturday	**08:00–16:00**
Exhibition tear down	
Saturday	**16:00–20:00**

See you next year!

Mark your calendar!

Advances in Glaucoma Research and Clinical Science

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