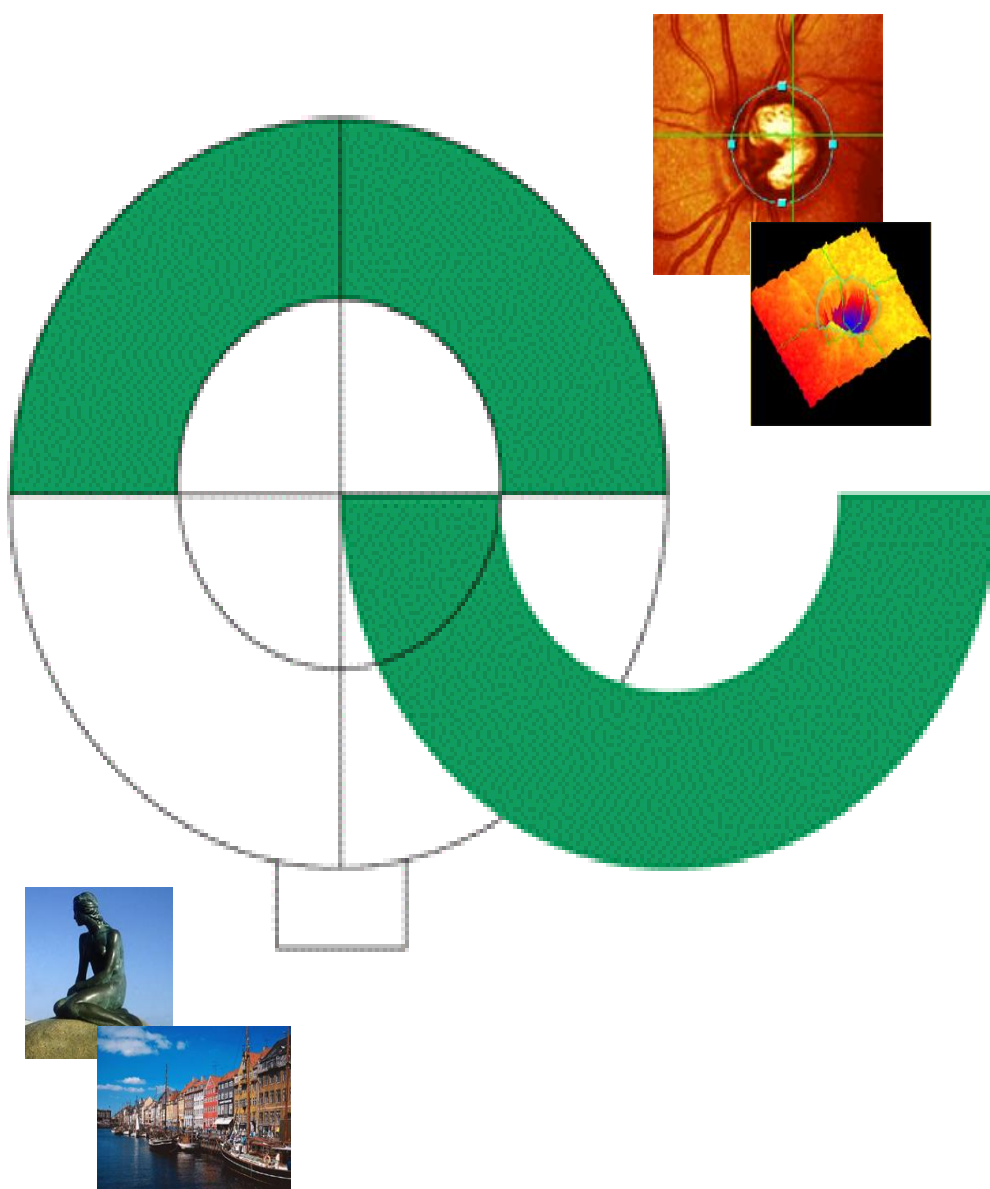


EUROPEAN GLAUCOMA SOCIETY



EGS CLOSED MEETING IN COPENHAGEN
5 – 7 SEPTEMBER 2003



EUROPEAN GLAUCOMA SOCIETY

5 September 2003

EGS Closed Meeting

**5/6 September 2003
Copenhagen, Denmark
Copenhagen Admiral Hotel**

Dear fellow EGS member.

Welcome to the 4th Closed Meeting of the EGS. These occasions give our Society the chance to meet in a small group, in favoured surroundings, and discuss recent advances in Glaucoma as well as identify issues specific to our Society and to European Glaucoma.

The Closed meeting has developed over the past years. It began, in Würzburg, as a small closed and purely scientific meeting with paper and poster presentations. Subsequent meetings have added debates, policy discussions and on this occasion sessions that address common problems within the EU -the ability to work to our strength and generate multicentre trials.

We meet in the lovely town of Copenhagen under the direction of John Thygesen. To him and OIC goes the credit for the organisation and the social events.

As always a word of thanks to our sponsors, who we welcome to the meeting and ask to join in what should be 2 fruitful days of scientific and social discussion.

Roger A. Hitchings
President of EGS



EUROPEAN GLAUCOMA SOCIETY

Dear fellow EGS members, guests and companions.

A warm welcome to the 4th Closed Meeting of the EGS and to wonderful Copenhagen. On behalf of the local organizing committee, I hope that you will experience an enjoyable stay in Copenhagen. We have tried to mix the scientific and social program in a way that allows you to meet colleagues and friends in the glaucoma field in a relaxed atmosphere. It is our hope that this will stimulate you to exchange your glaucoma experiences and discuss recent advances in Glaucoma, but also to make new friends.

As you will see, Copenhagen is a city surrounded by water. In the social program you will have the opportunity to sail in the old canals of the city, to visit the Tivoli gardens and to have a trip along the Danish Riviera Coast to the world famous modern art museum Louisiana. Afterwards we will have dinner in the restaurant of the Royal Yacht Club in Rungsted.

I want to thank our sponsors, *Allergan, Alcon and Pfizer* who through their generosity have made the organization of this closed EGS meeting possible.

I also want to thank the representatives from OIC srl: Roberto Bucciarelli, Rafaella Gailli, Viola Kamphausen and Monica Daliana for their great help.

A special thank goes to the EGS Executive Committee and the local organizing committee for their great support.

John Thygesen

Local Organizers

Danish Glaucoma Society
John Thygesen
Svend V. Kessing

EGS Executive Committee

Roger A. Hitchings (President)
Erik Greve
Carlo Traverso
Clive Migdal
Franz Grehn
Günther Krieglstein
Allan Bechetoille
John Thygesen

PROGRAM

FRIDAY 5 SEPTEMBER 2003

- 14:00 – 14:10** **Welcome**
- 14:10 – 15:50** **SESSION 1 *Free papers***
Moderators: Yves Lachkar and Gabor Hollo
- 15:50 – 16:10** *Tea/Coffee*
- 16:10 – 17:30** **SESSION 2 - *Angle Closure Glaucoma***
Moderators: Paul Foster and John Thygesen

-
- 18:15 !!! Meet in the reception of Hotel Admiral for boat departure
- 18:30 - 19:30 Canal Boat: 1 hour sailing on the old canals of Copenhagen
- 19:30 - 20:00 Walk from boat to and through The Tivoli Gardens
- 20:00 - (23:00) TIVOLI GARDENS: Dinner in Restaurant Nimb

SATURDAY 6 SEPTEMBER 2003

- 8:15 – 9:00** **Business Meeting**
- 9:00 – 9:15** **Host Lecture**
The role of Danish ophthalmology in glaucoma
Svend V. Kessing and John Thygesen
- SESSION 3 – 6: RANDOMIZED CLINICAL TRIALS AND THE EGS:**
- 9:15 – 11:15** **SESSION 3 –*Imaging and Psychophysics***
Moderators: Carlo Traverso and Ted Garway-Heath
- 11:15-11:45** *Tea/Coffee*
- 11:45 – 13:00** **SESSION 4 –*What are appropriate Target Pressures?***
Moderators: Clive Migdal and Stefano Miglior
- 13:00 – 14:00** *Lunch*
- 14:00 – 15:30** **SESSION 5 - *How best to achieve our Target Pressures; Medical treatment, Laser, NPDS or Fistulising surgery? Wound healing.***
Moderators: Franz Grehn and Peng Khaw
- 15:30 – 15:45** **Break**
- 15:45 – 17:30** **SESSION 6 - *How best to organise pan- European studies, collaboration and funding***
Moderators: R A Hitchings and Norbert Pfeiffer

SATURDAY 6 SEPTEMBER 2003 cont.....

- 18:00 Leave Hotel
- 18.15 Bus to Louisana Art Gallery for reception and drinks.
 then on to the Rungsted Harbour
- 20.15 Dinner at Rungsted Harbour at Nokken Royal Yacht Club Restaurant
 Music and dance.
- 23:30 Bus transport back to the hotels

Copenhagen Admiral Hotel



Copenhagen Admiral Hotel –
Toldbodgade 24-28
DK-1253 Copenhagen K
Denmark .
Tel. +45 33 74 14 14
Fax +45 33 74 14 16

Danish quality of international class, set in a carefully restored 1780's protected building. Originally a granary, the rustic charm of its thick brick walls, large arches and Pomeranian pine beams has been retained as the setting for thoroughly modern hotel comfort. Following a complete renovation of all 366 rooms the 200-year-old Copenhagen Admiral Hotel appears even more unique and attractive than when the hotel opened in 1978.

With respect to the history of the impressive building, a former granary, the main idea behind the modernisation has been to emphasize the rustic and maritime stile, so characteristic of the Copenhagen Admiral Hotel.

The furniture designed with gratings contributes to the maritime atmosphere, and has been very important in the adjustment to the warehouse. Furthermore, the Copenhagen Admiral Hotel is situated on one of the best and most fashionable addresses in Copenhagen at the harbour promenade with the Queen, Amalienborg Palace and the beautiful garden "Amaliehaven" as close neighbours.

Friday, September 5:

14:00 – 14:10 Welcome

14:10 – 15:50 SESSION 1	<i>Free papers</i>
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Moderators: Yves Lachkar and Gabor Hollo

6 minutes presentations followed by 4 minutes questions

14:10 - 14:16 (14:20)

A Critical Appraisal of the Literature in Ophthalmology and the Glaucoma Guidelines

Augusto Azuara-Blanco, Chris Mercer

Department of Ophthalmology, Aberdeen Royal Infirmary, University of Aberdeen, Aberdeen, United Kingdom.

14:20 - 14:26 (14:30)

Scoring system for chronic open angle glaucoma.

Yves Lachkar

Saint Joseph Hospital-Paris, France.

14:30 - 14:36 (14:40)

Pachymetry before or after applanation tonometry: does it matter?

T. Zeyen, C. Deghislage, M. Goethals, L. Van Malderen, S. Pourjavan

Dept. Ophthalmology, University of Leuven, Belgium

14:40 – 14:46 (14:50)

Morphological assessment of the optic nerve head: OCT2 vs HRT

T. Rolle, B. Brogliatti, B. Roagna, L. Vera-Torres, A. Fornero, L. Belli, G.M. Vizzeri, F.M. Grignolo.

Department of Clinical Physiopathology – Section of Ophthalmology-University of Turin – Italy

14:50– 14:56 (15:00)

Topical antiglaucoma treatments induce inflammation and apoptosis in the conjunctival epithelium: an *ex vivo* and *in vitro* study

C. Baudouin ⁽¹⁾, P.J. Pisella ⁽²⁾, P. Hamard ⁽¹⁾, C. Debbasch ⁽³⁾, C. Creuzot-Garcher ⁽⁴⁾, J. M. Warnet ⁽³⁾ F. Brignole ⁽³⁾.

⁽¹⁾ Quinze-Vingts National Ophthalmology Hospital, University Paris 6. ⁽²⁾ Dpt of Ophthalmology, Tours University Hospital. ⁽³⁾ Laboratory of Toxicology, School of Pharmaceutical Sciences University Paris 5. ⁽⁴⁾ Dpt of Ophthalmology, Dijon University Hospital, France.

Friday, September 5: Session 1 - *Free papers cont...*

15:00 – 15:06 (15:10)

Intraocular Pressure After Intravitreal Injection of Triamcinolone Acetonide

Jost B. Jonas, M.D., Ingrid Kreissig, M.D., and Robert Degenring, MD

Department of Ophthalmology, Faculty of Clinical Medicine Mannheim of the University Heidelberg, Germany

15:10 – 15:16 (15:20)

Indomethacin decreases optic nerve oxygen tension

D.B. Pedersen¹, E. Stefánsson², T. Eysteinnsson², J.F. Kiilgaard^{1,4}, M. la Cour¹, K Bang³, P.K. Jensen¹.

Department of Ophthalmology, Rigshospitalet, Denmark¹ University of Iceland, Iceland², Merck, Sharp & Dohme, Denmark³ and University of Copenhagen, Denmark

15:20 – 15:26 (15:30)

Deep Sclerectomy with Mitomycin C (0.04%) in High Risk Eyes

PK Wishart, HM Herbert

Royal Liverpool University Hospital, Liverpool, United Kingdom

15:30 – 15:36 (15:40)

Glaucoma filtration surgery using intrastromal Holmium laser keratostomy (ILK). Retrospective evaluation of a clinical series.

P. Riise, G. Boberg-Ans, P.H. Alsbirk.

Eye Department, Hillerød Hospital, Hillerød, Denmark.

15:40 – 15:46 (15:50)

Factors Associated with Long-term Progression or Stability in Exfoliation Glaucoma

A.G.P. Konstas¹, G. Hollo², Y.S. Astakhov³, M.A. Teus⁴, E.L. Akopov³, W.C. Stewart^{5,6}

¹University Department of Ophthalmology, AHEPA Hospital, Thessaloniki, Greece; ²Department of Ophthalmology, Semmelweis University, Budapest, Hungary;

³University Department of Ophthalmology, Saint-Petersburg, Russia;

⁴Hospital Oftalmologico Internacional de Madrid, Madrid, Spain;

⁵Pharmaceutical Research Corporation, Charleston, SC, U.S.A.;

⁶Department of Ophthalmology at the University of South Carolina, Columbia, SC, U.S.A.

15.50 - 16.10 Tea/Coffee

Friday, September 5:

16:10 – 17:30 SESSION 2 <i>Angle Closure Glaucoma</i>

Moderators: *Paul Foster and John Thygesen*

INTRODUCTORY PAPERS: (15 minutes + 7 min discussion)

16:10 - 16:25 (16:32)

New Danish Guidelines for Primary Angle Closure

Svend Vedel Kessing, MD, DMSc and John Thygesen MD

The Glaucoma clinic, Eye Department, Copenhagen University Hospital, Copenhagen, Denmark.

16:32 - 16:47 (16:54)

Angle closure glaucoma. Classification/Diagnosis/Phenotype

Paul Foster.

Division of Epidemiology, Institute of Ophthalmology. Bath Street
London EC1V 9EL.

ABSTRACTS 7 minutes presentations followed by 7 minutes questions

16:54 - 17:01 (17:08)

**Anterior chamber depth measurement by optical pachymetry:
Systematic difference using the Haag-Streit attachments no. I for
corneal thickness & II for chamber depth versus attachment no. II
alone.**

R.R.A Bourne¹, P.H. Alsbirk²

¹Department of Epidemiology & International Eye Health, Institute of
Ophthalmology, University College, London, UK & Moorfields Eye Hospital,
London, UK. ²Eye Department, Hillerød Hospital, Hillerød, Denmark

17:08 - 17:15 (17:22)

Primary angle closure glaucoma in Greenlanders. An overview

P.H. Alsbirk, J. Thygesen

Greenland Eye Service, Copenhagen University Eye Clinic, Rigshospitalet,
Copenhagen, Denmark

17:22 – 17:30

General discussion on Angle Closure

17:30 End of session

18:15: Meet in the reception of Hotel Admiral for boat departure

Saturday, September 6:

8:15 – 9:00 Business Meeting

9:00 – 9:15 Host Lecture

The role of Danish ophthalmology in glaucoma
Svend V. Kessing and John Thygesen

RANDOMIZED CLINICAL TRIALS AND THE EGS:
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9:15 – 11:15 SESSION 3 <i>Imaging and Psychophysics</i>
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Moderators: *Carlo Traverso and Ted Garway-Heath*

INTRODUCTORY PAPERS: *(15 minutes + 6 minutes discussion)*

9:15 - 9:30 (9:36)

Ophthalmoscopy versus imaging for glaucoma diagnosis: Pros and cons.

Jost Jonas

University Eye Clinic of Mannheim, Germany

9:36- 9:51(9:57)

Does imaging parallel psychophysics in glaucoma?

Michele Iester

Clinica Oculistica Di.N.O.G. University of Genova, Italy

ABSTRACTS: *(7 minutes presentation + 6 minutes discussion)*

9:57 – 10:04 (10:10)

Fixed-angle and customised corneal-polarisation compensation for scanning laser polarimetry: comparison and correlation with function

Holló G, Katsanos A, Kóthy P

st
1 Department of Ophthalmology Semmelweis University, Budapest, Hungary

10:10 – 10:17 (10:23)

The nerve fiber layer symmetry test: An automated evaluation of the human retinal nerve fiber layer thickness as measured by optical coherence tomography

J.L. Hougaard^{1,2}, A. Heijl², E. Krogh¹.

¹Department of Ophthalmology, Herlev Hospital, University of Copenhagen, Denmark.

²Department of Ophthalmology, Malmö University Hospital, Sweden.

Saturday, September 6: Session 3 - *Imaging and Psychophysics cont...*

10:23 – 10:30 (10:36)

The impact of POAG definition on the cross-sectional assessment of HRT diagnostic validity

S. Miglior¹, M. Guareschi², E. Albe^{1,2}, F. Romanazzi¹, S. Gomasasca¹, N. Orzalesi²

¹Department of Neurosciences, University of Milan Bicocca, Milan, Italy;

²Department of Medicine, Surgery and Dentistry, University of Milan, Milan, Italy.

10:36– 10:43 (10:49)

The Relationship Between Heidelberg Retina Tomograph Defined Rim Area and Visual Field Sensitivity

NG Strouthidis, DF Garway-Heath

Glaucoma Research Unit, Moorfields Eye Hospital and Institute of Ophthalmology, London

10:49 – 10:56 (11:02)

Automated Classification of the Optic Nerve Head for Glaucoma Screening

Michelson G, Chrastek R**, Wolf M**, Donath K**, Hothorn T***, Lausen B***, Lämmer R*, Mardin CY*, Niemann H***

***Department of Medical Informatics, Biometry and Epidemiology, FAU Waldstrasse 6, 91054 Erlangen, Germany. **Knowledge Processing Group. FORWISS Erlangen, Haberstr. 2, 91058 Erlangen, Germany. *Department of Ophthalmology and Eye Hospital, FAU, Schwabachanlage 6, 91054 Erlangen, Germany.

11:02 – 11:09 (11:15)

Correlation of Visual Field Sensitivity and Retinal Nerve Fibre Layer Thickness as Measured by Scanning Laser Polarimetry.

P.G. Schlottmann¹, D.S. Greenfield², J.Caprioli³, D.F. Garway-Heath¹.

¹Glaucoma Research Unit, Moorfields Eye Hospital, London, United Kingdom;

²Department of Ophthalmology, Bascom Palmer Eye Institute, Miami, FL;

³Glaucoma Division, Jules Stein Eye Institute, Los Angeles, CA.

11.15-11.45

Tea/Coffee

Saturday, September 6:

11:45 – 13:00: SESSION 4	<i>What are appropriate Target pressures?</i>
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Moderators: *Clive Migdal and Stefano Miglior*

1. **Introduction.....** *Clive Migdal , UK*
2. **Target IOP – Concept and definition.....***Steve Vernon, UK*
3. **Role of IOP in Glaucoma Pathogenesis***Francisco Goni, Spain*
4. **How to estimate a target IOP***Augusto Azuaro-Blanco,UK*
figures and formulations
5. **Evidence that target IOP makes a
difference - the proof of the pudding** *Stephano Gandolfi, Italy*
6. **Discussion**
7. **Summary and take-home points***Stefano Miglior, Italy*

13.00 - 14.00 **Lunch**

Saturday, September 6:

14:00 -15:30 SESSION 5

How best to achieve our Target Pressures: Medical treatment, Laser, NPDS or Fistulising surgery? Wound healing.

Moderators: *Franz Grehn and Peng Khaw*

6 minutes presentations + 6 minutes discussion

Does the site of filtration influence the medium to long-term Intraocular Pressure control following filtering surgery?

Negi AK, Kiel W, Vernon SA.

Dept of Ophthalmology, University Hospital. Nottingham UK

TGFb in ocular wound healing : TGFb signalling in primary human tenon fibroblasts and evaluation of TGFb regulated PAI-1 in different glaucoma subgroups

Meyer-ter-Vehn T^{1,3}, Wimmer I., Fuchshofer R.², Grehn F.¹, Knaus P.³, Lütjen-Drecoll E²

¹Universitätsaugenklinik Würzburg. ²Institut für Anatomie II, Universität Erlangen

³Institut für physiologische Chemie II, Universität Würzburg

Postoperative Mitomycin For Primary Trabeculectomy

Postoperative Mitomycin For Complicated Trabeculectomy

Holger Mietz

Department of Ophthalmology, University of Cologne, Germany

Vision preservation in patients with end-stage glaucoma following trabeculectomy with mitomycin

F. Topouzis, A. Koskosas, Th. Pappas, E. Anastasopoulos, L. Mavroudis.

Department of Ophthalmology, Aristotle University of Thessaloniki, Thessaloniki, Greece

Modulating Matrix Metalloproteinases Prevents Scarring and Failure of Glaucoma Filtration Surgery

P.T. Khaw, T.T.L. Wong, A.L. Mead, J.T. Daniels.

Wound Healing Research Unit and Glaucoma Unit, Institute of Ophthalmology and Moorfields Eye Hospital, London, England.

Double Molteno Implant in Refractory Glaucoma: Long term results

Susana Duch MD^{1,2}, David Andreu² MD, Juan Lillo MD¹.

¹Department of Ophthalmology. Ciudad Sanitaria y Universitaria de Bellvitge, Barcelona, Spain, ² Instituto Condal de Oftalmología Grupo ICO. Barcelona, Spain

Cyclodiode: Long-term IOP and acuity results of treatment utilising a standard protocol

Vernon SA, Koppens JM, Negi A .

Dept of Ophthalmology, University Hospital. Nottingham UK

Saturday, September 6:

15:45- 16:00 Tea/Coffee

16:00 -17:30 SESSION 6	<i>How best to organise pan- European studies, collaboration and funding</i>
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Moderators: *Roger A Hitchings and Norbert Pfeiffer*

1. **Introduction.....** *Roger Hitchings, UK*
2. **Why we need trials and what can we learn** *Anja Tuulonen, Finland*
3. **Clinical trials - equating purity with practice...** *Richard Wormald, UK*
4. **How to set up collaborative trials in Europe....** *Zrenner*
5. **Economics and trials the need and the reality...** *Gisela Kobelt, France*
6. **The EGS experiance-
The Glaucoma prevention study** *Norbert Pfeiffer, Germany*
7. **The potential for Industry collaborations** *Gunilla Norrgren, Sweden*

ABSTRACTS

Friday, September 5: 14:10 – 15:50

Free papers

Moderators: *Yves Lachkar and Gabor Hollo*

A Critical Appraisal of the Literature in Ophthalmology and the Glaucoma Guidelines

Augusto Azuara-Blanco, Chris Mercer

Department of Ophthalmology, Aberdeen Royal Infirmary, University of Aberdeen, Aberdeen, United Kingdom.

Purpose: To assess the quality of reporting of the literature in Ophthalmology and the Glaucoma Guidelines developed by the American Academy of Ophthalmology (AAO) and the European Glaucoma Society (EGS).

Methods: The study designs used in clinical research and published in four leading ophthalmology journals (Ophthalmology, Am J Ophthalmol, Arch Ophthalmol and Br J Ophthalmol) during a 4-month period in 1993 and 2003 were reviewed. The Practice guidelines produced by the AAO (1996) and the EGS (1998) were assessed according to the criteria proposed by Grilli et al. (Lancet 2000).

Results: In 1993 (n=208), the most common design was Case Series (62.9%), followed by Controlled Trials (14.8%) and Randomised Controlled Trials, RCT, (6.2%). In 2003 (n=323), Case Series were used in 54.3% of reports, followed by Controlled Trials (13.2%), Cross Sectional (8.9%) and RCTs (8.0%). Regarding the Glaucoma Guidelines, the most common study design was Case Series, with a percentage of 38.8% and 31.4% of citations in the AAO and EGS guidelines, respectively. The percentage of RCT cited in the AAO and the EGS guidelines was 22.2% and 25.9%, respectively. In the EGS guidelines there was no explicit grading of the strength of recommendations.

Conclusions: There seems to be a slight improvement in the quality of reporting in the literature in Ophthalmology over the last decade. The current AAO and EGS glaucoma guidelines may not be fully supported by scientific evidence.

Commercial Relationship: None

Support: None

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Scoring system for chronic open angle glaucoma.

Yves Lachkar

Saint Joseph Hospital-Paris, France.

Purpose: The aim of this study was to evaluate a scoring system for chronic open angle glaucoma. We devised an empirical scoring system grading severity of the disease and correlating this to treatment.

Material and methods: 90 patients were evaluated by 11 parameters that were:

- 1: family history of glaucoma: blindness(2), yes (1) no (0)
- 2: juvenile (4)
- 3: race; Caucasian(0), Asiatic(1), Afro-Caribbean(2)
- 4: myopia: 0-6 diopters (1); 6 to 12 diopters(2), >12 diopters(3)
- 5: pigment dispersion or pseudoexfoliation (1)
- 6: Intraocular pressure without treatment: >30 mm Hg(4); 25-30 mm Hg(3), 20-25 mm Hg (2)
- 7: corneal central thickness: <520 μ (3), >520 μ (0)
- 8: optic disc appearance: suspect (1): c/d < 0.5 and/or small disc, pathological (4): c/d ratio > 0.5, notching
- 9: visual field defect: early (1), moderate(3), advanced (5):using Hodapp classification
- 10: vascular risk factors : yes (1), no (0)
- 11: loss of one eye to glaucoma (4)

Scoring values were 2 to 34. We correlate this score to the treatment of the patient: medical or surgical, number of glaucoma medications

Results: Patients were divided in three groups ; group 1 (36 patients) score 0 to 8, group 2 (24 patients) score 9 to 13, group 3 (30 patients) score above 13. Distribution between patients treated with medicine (mean number of medications) and patients with filtering surgery was : group 1 : medical treatment : 1.63+/-0.73 medications ; surgery 4/36 ; group 2 : medical treatment: 2.00+/-0.7 medications, surgery 17/24. group 3 : medical treatment : 2.12+/-0.67 medications, surgery 27/30. 88 % of the patients did not had filtering surgery in the group 1 but 90 % of the patients in group 3 had filtering surgery.

Conclusion. This scoring system seems to be an easy and practical tool to evaluate chronic open angle glaucoma. It could be a tool to evaluate target pressure. Others studies are necessary to validate and /or modified this score or to evaluate ocular hypertension.

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Pachymetry before or after applanation tonometry: does it matter?

T. Zeyen, C. Deghislage, M. Goethals, L. Van Malderen, S. Pourjavan

Dept. Ophthalmology, University of Leuven, Belgium

Purpose:

Pachymetry has become a standard assessment in patients with ocular hypertension and normal tension glaucoma. We wanted to evaluate if the accuracy of central corneal thickness measurement (CCT) was influenced by applanation tonometry (AT) and vice versa.

Methods:

We examined prospectively 60 healthy volunteers. Contact lens wearers or patients with previous surgery were excluded. The sequence of the examinations in the right eye was: CCT - AT - CCT. The sequence of the examinations in the left eye was: AT - CCT - AT. The measurements were done consecutively. One clinician examined all the patients with the same pachymeter (DGH-500 Pachette TM) and Goldmann applanation tonometer. Two tonometry and 5 pachymetry measurements were averaged each time. Pearson correlation coefficient was used to calculate the correlations and a paired t-test to calculate the differences between the measurements.

Results:

36 female and 24 males were included. The mean age was 62 ± 13 years (27 – 90 years). The average refractive error for both eyes was +0.3 D (-6 to +6 D). In the right eye the mean CCT before and after AT was respectively $565 \pm 33 \mu$ and $566 \pm 34 \mu$ ($p=0.34$, $r=0.98$). In the left eye the mean AT before and after pachymetry was respectively 19.4 ± 4.7 mmHg and 19.2 ± 4.3 mmHg ($p=0.43$, $r=0.86$).

Conclusions:

There was no difference in the CCT measured before or just after AT, nor was there any difference between AT taken before or just after pachymetry. The sequence of the two examinations does not seem to matter in normal individuals.

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Morphological assessment of the optic nerve head: OCT2 vs HRT

T. Rolle, B. Brogliatti, B. Roagna, L. Vera-Torres, A. Fornero, L. Belli, G.M. Vizzeri, F.M. Grignolo.

Department of Clinical Physiopathology –
Section of Ophthalmology- University of Turin – Italy .Head Prof. F.M.
Grignolo.

Purpose: to investigate the relationship between optic nerve head (ONH) parameters generated by OCT2 (Optical Coherence Tomography version II, Zeiss-Humphrey Instruments, Dublin, CA) and HRT parameters (Heidelberg Retina Tomograph, Heidelberg Engineering, Germany) and the ability in the detection of optic nerve head structural glaucomatous damage.

Methods: 46 eyes of 43 consecutive patients affected with primary open angle glaucoma (POAG), and 15 eyes of 15 healthy subjects were recruited and underwent complete ophthalmic examination and evaluation of optic nerve head morphology by means of OCT2 and HRT. The quality of the images was assessed with the aid of HRT software and by the experience of the observers; the location of the disc margin in OCT2 scans were manually corrected for the best fit to the subjective interpretation of the optic nerve head margin. The parameters considered were: disc area, cup area, cup/disc area ratio, cup volume, rim volume. Correlations between OCT2 and HRT parameters in POAG eyes were determined using Spearman's correlation coefficient. The ability of OCT2 and HRT in evaluation of glaucomatous optic nerve head changes was performed with Receiver Operating characteristic (ROC) curves.

Results: high correlations were found among some OCT2 and HRT parameters (CA rs 0.64; C/D area ratio rs 0.76; CV rs 0.70). The correlations among the others OCT2 and HRT parameters were less consistent. The larger areas under the receiver operating characteristics (AROC) curve were those related to cup area (OCT 0,66; HRT 0,74), cup/disk area ratio (OCT 0,69; HRT 0,79) and cup volume (OCT 0,66; HRT 0,63).

Conclusions: both OCT2 and HRT have a considerable potential for use as adjunctive measures of glaucomatous damage. Cup Area, C/D Area Ratio, Cup volume parameters can be used to discriminate between normal eyes and those with ONH glaucomatous damage with good diagnostic precision but the sensitivity and specificity of the best parameters of these instruments are probably not sufficient to warrant use as a sole screening method in the general population: a computerized morphological assessment of the optic nerve head must be always correlate to a complete ophthalmological examination

Commercial Relationship: none

Support: none

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Topical antiglaucoma treatments induce inflammation and apoptosis in the conjunctival epithelium: an *ex vivo* and *in vitro* study

C. Baudouin ⁽¹⁾, PJ Pisella ⁽²⁾, P. Hamard ⁽¹⁾, C. Debbasch ⁽³⁾, C. Creuzot-Garcher ⁽⁴⁾, J. M. Warnet ⁽³⁾ F. Brignole ⁽³⁾.

⁽¹⁾ Quinze-Vingts National Ophthalmology Hospital, University Paris 6. ⁽²⁾ Dpt of Ophthalmology, Tours University Hospital. ⁽³⁾ Laboratory of Toxicology, School of Pharmaceutical Sciences University Paris 5. ⁽⁴⁾ Dpt of Ophthalmology, Dijon University Hospital, France.

Purpose: To compare the proinflammatory effects of antiglaucoma drugs on the conjunctival epithelium, *ex vivo* in impression cytology (IC) specimens, and *in vitro*, on a conjunctival cell line. IC from patients receiving latanoprost, preserved or unpreserved beta-blockers and various associations of treatments were analyzed by flow cytometry and compared to conjunctival imprints from normal untreated eyes.

Methods: A total of 130 glaucomatous and 30 normal eyes were examined. All groups of patients were comparable for age and durations of treatment. Specimens were assessed for inflammatory profile (using antibodies directed against HLA DR, ICAM-1, IL-6, IL-8 and IL-10) and mucin detection (anti- MUC5AC antibody). They were analyzed by using an Epics XL flow cytometer and levels of expression were quantified using fluorescent calibrated beads. In addition, a continuous human conjunctival cell line was treated with unpreserved timolol, 0.02% BAC-containing timolol, 0.02% BAC alone and 0.02%BAC-containing latanoprost for 15 minutes. Analyses were performed immediately after and following 4 hours and 24 hours of cell recovery in normal medium. Membrane integrity was assessed using a neutral red test and chromatin condensation with a Hoechst 33342 test by using microplate cold light cytofluorimetry in order to evaluate Hoechst/neutral red ratio for apoptosis assay.

Results: IC analyses showed a significantly increased expression of all inflammatory markers, in all groups excepted the unpreserved beta-blocker one, as compared to normal untreated eyes. The multitherapy group showed the highest values, followed by preserved beta-blocker and prostaglandin groups, at significantly lower levels. In the *in vitro* study, after 15 minutes of contact, apoptosis was observed with preserved timolol and latanoprost, but significantly less important than that observed with BAC alone, despite the same concentration of preservative in all solutions. Unpreserved timolol did not show any toxicity.

Conclusion: We demonstrate the overexpression of inflammatory markers by conjunctival cells from patients undergoing glaucoma treatment. Prostaglandin analogue induced lower inflammation than could be expected and significantly less HLA DR and ICAM-1 than did preserved beta-blockers. *In vitro* latanoprost seemed to protect conjunctival cells from benzalkonium toxicity. It remains to determine the respective roles of preservative and active compounds in the stimulation of inflammation in the ocular surface of patients receiving long-term antiglaucoma treatments.

Financial interest: none of the author has any commercial interest

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Intraocular Pressure After Intravitreal Injection of Triamcinolone Acetonide

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Background. To investigate the intraocular pressure (IOP) response after intravitreal injections of triamcinolone acetonide as treatment of intraocular neovascular or edematous diseases.

Methods. The prospective consecutive non-comparative interventional case-series study included 71 patients (75 eyes) with progressive exudative age-related macular degeneration (n=64 eyes) or diffuse diabetic macular edema (n=11 eyes), who received an intravitreal injection of 25 mg triamcinolone acetonide. Mean follow-up time was 6.86 ± 2.52 months (range, 3.1-14.47 months).

Results. Intraocular pressure increased significantly ($P < 0.001$) from 15.43 ± 3.26 mm Hg preoperatively to a mean maximum of 23.38 ± 8.37 mm Hg (range, 13 – 64 mm Hg) postoperatively. An IOP rise to values higher than 21 mm Hg was observed in 39 (52%) eyes. Elevation of IOP occurred about two months after the injection. Preoperative predictive factor for the rise in IOP was younger age ($p = 0.013$). It was statistically independent of refractive error, presence of diabetes mellitus, and indication for the injection. In all but one eye, IOP could be lowered to the normal range with topical medication, without development of glaucomatous optic nerve head changes. In the eyes with an elevation of IOP, IOP normalized about six months after the injection, without further medication. Eyes undergoing repeatedly intravitreal injections of triamcinolone acetonide showed only an elevation of IOP, if after the first injection a rise of intraocular pressure had occurred.

Conclusions. After intravitreal injections of 25 mg of triamcinolone acetonide, an IOP elevation can develop in about 50% of eyes, starting about one to two months after the injection. In the vast majority, IOP can be normalized by topical medication, and returns to normal values without further medication about 6 months after the injection.

Proprietary interest: none

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Indomethacin decreases optic nerve oxygen tension

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Purpose: Non-steroid anti-inflammatory drugs (NSAID) such as ibuprofen and indomethacin are widely used in the treatment of pain and inflammatory diseases. It is controversial if NSAIDs affect blood flow in the brain and the eye. We investigated how indomethacin affects the optic nerve oxygen tension (ONPO₂) in the pig and if it affects the ONPO₂ rising effect of CO₂ breathing and carbonic anhydrase inhibition.

Methods: Optic nerve oxygen tension (ONPO₂) was measured in 5 pigs with a polarographic oxygen electrode. The tip of the electrode was placed 0.5 mm above the optic disc. 3% CO₂ breathing was induced for 30 minutes; after ONPO₂ had returned to baseline, 300 mg indomethacin was injected intravenously. 60 minutes hereafter, 3% CO₂ breathing was induced for 30 minutes again, and back to baseline 500 mg dorzolamide was injected intravenously. ONPO₂, arterial blood pressure, heart rate and arterial blood gasses were recorded continuously. The effects of CO₂ breathing and carbonic anhydrase inhibition on ONPO₂ with or without indomethacin treatment were compared.

Results: Baseline ONPO₂ (mean $\pm$ SD) was 2.33 ± 2.4 kPa (n=5). Administration of 300 mg indomethacin decreased ONPO₂ by -1.22 ± 0.43 kPa (p<0.05, n=5). CO₂ breathing increased ONPO₂ by 0.66 ± 0.23 kPa (p<0.05) and nonsignificantly by 0.17 ± 0.25 in indomethacin treated pigs (n=4). 500 mg dorzolamide increased ONPO₂ by 0.73 ± 0.34 in controls (p<0.05) and by 0.22 ± 0.12 kPa (n=5) after indomethacin (p<0.05). The ONPO₂ increasing effects of CO₂ breathing and dorzolamide after indomethacin were significantly smaller than in control pigs.

Conclusion: Systemic administration of indomethacin caused a decrease in ONPO₂, probably due to decreased blood flow through vasoconstriction of vessels in the optic nerve. This may also happen in the retina. Additionally, indomethacin diminishes the ONPO₂ increasing effect of CO₂ breathing and carbonic anhydrase inhibition, thus affecting the reactivity of vessels in the optic nerve. Further investigations are needed to clarify whether other NSAIDs have the same effect as indomethacin and also if the drugs orally or topically administered affect optic nerve oxygen tension.

Commercial Relationship: D.B. Pedersen: F, E. Stefánsson: F, T. Eysteinnsson: F, J.F. Kiilgaard: F, M. la Cour: F, K. Bang: E, P.K. Jensen: F

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Deep Sclerectomy with Mitomycin C (0.04%) in High Risk Eyes

PK Wishart, HM Herbert

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Purpose: To assess the safety and efficacy of deep sclerectomy with low dose MMC 0.04% in eyes with previous failed trabeculectomy or glaucoma secondary to uveitis. Delivery of a low dose of MMC was achieved by applying MMC topically for a reduced exposure time (1-2 minutes) or by injecting a very small volume sub- conjunctivally at operation. Particular attention was paid to the nature of the blebs post-operatively.

Methods: Non-randomised consecutive case series. Nine eyes with glaucoma secondary to uveitis and 12 eyes with previous failed trabeculectomy were included in the study and followed prospectively. All eyes had uncontrolled IOP despite maximum tolerated medication and underwent deep sclerectomy performed by one of the authors (PKW). Eight eyes had MMC applied for 1-2 minutes with a sponge to the operation site and 13 eyes had per-operative subconjunctival injection of 0.04 ml MMC 0.04%.

Results: Twenty one patients (21 eyes) were included, 9 eyes with uveitis and 12 eyes with previous failed trabeculectomy. The mean age was 63 (range 19-80 years). Mean pre-operative IOP was 31 mm Hg (range 22-48). Mean follow-up was 18 months (range 6-54 months). Mean IOP at 12 months was 12.4 mm Hg and at 18 months was 14.23 mm Hg. In the uveitic group 1 eye failed completely at 9 months post-operatively with a second attack of hypertensive uveitis. This eye required an Ahmed valve implant. By final follow-up all other eyes were successful (IOP less than 21 mm Hg) although 3 eyes required one medication to achieve this. Three eyes required post-op YAG laser goniopuncture. Complications – 3 eyes perforation of the trabecular window with 1 eye requiring per-op peripheral iridectomy. One eye developed post-op iris incarceration. In the uveitic eyes 3 eyes developed cystoid macular oedema which resolved spontaneously in the early post-operative period. One eye developed a large avascular bleb which leaked giving rise to post-operative CMO and hypotony. No other eyes in this series developed a cystic or avascular bleb. Four eyes had short-lived choroidal detachments.

Conclusion: Deep sclerectomy with MMC provides an effective method of achieving good IOP control in eyes at high risk of failure with filtering surgery. The small volume method of delivering MMC appears to be safe and effective producing satisfactory drainage blebs when used with deep sclerectomy.

Commercial Relationship: PK Wishart , None; HM Herbert, None.

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Glaucoma filtration surgery using intrastromal Holmium laser keratostomy (ILK). Retrospective evaluation of a clinical series.

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Purpose: To evaluate the long-term efficacy and safety of a new glaucoma filtering procedure.

Methods: ILK was used as routine filtration procedure between 1996 and 2000, according to Kessing et al.: *Ophthalmic Surg Lasers* 2000;31:13. - A total of 28 eyes of 21 patients were operated. Median age was 58 years (range 39-78). All patients except 4 received a fractionated amount of Mitomycin C up to 6 micrograms at the preferred site 2 hours prior to surgery. The main surgical steps were formation of a 2,25 mm wide retrograde corneoscleral tunnel from 2 mm central to limbus to 2 mm peripheral to limbus, with incision of Tenon's capsule but not conjunctiva. With a Sunrise® Holmium probe the floor of the tunnel was perforated just central to Schlemm's canal and the wound closed with 2 nylon 10-0 sutures.

Results: All eyes had poorly controlled glaucoma and 11 eyes were considered of high risk at surgery. Median follow up was 30 months (range 5½-80 months). Preoperative IOP showed a mean of 31,6 mm Hg (SD 10,8, range 19-59 mm) on maximal tolerated medical therapy, and postoperative IOP mean was 14,0 mm Hg (SD 5,1, range 4-22 mm). Complete success (S) was defined as IOP below 20 at the end of the observation period without treatment, qualified success (qS) as IOP below 20 with medical therapy or one reoperation, and others considered failure. 18 eyes (64%) achieved S and 5 eyes (18%) qS, while 5 eyes (18%) were failures.

Postoperatively careful control was needed due to frequent early hypotony and later due to marked pressure peaks with e.g. 15 eyes > 30 mm, up to 70 mm. Management included YAG laser treatment of the Holmium laser created channels via a Trokel lens gonioscope (22 eyes), also up to months after surgery (e.g. 5 eyes >1 year, even one at 80 months). Early postoperative needling was done in 14 eyes, reoperation in 1, revision of the tunnel in 5, suture of a bleb leak in 2. Shallow chambers occurred in few only; 2 had early iris incarcerations, 5 choroidal effusions. One major ischemic bleb showed a late perforation, blebitis and iris incarceration, probably due to Mitomycin.

Discussion and Conclusions: ILK seems promising as it avoids any major surgical trauma to conjunctiva. It has shown a fairly satisfactory success rate in our hands, also in high-risk cases. However ILK in the present form required close long term follow up due to unpredictable marked IOP peaks. The Holmium laser created channels tend to show early and even late secondary closure. Thus postoperative YAG laser treatment(s) of the channels turned out to be a needed and valuable addition to ILK. Methods using a similar incisional approach but giving a more reliable filtration hole in the floor of the corneoscleral canal should be highly welcomed.

Commercial relationship: none.

Support: The Holmium Sunrise® laser was donated in 1994 by Carl and Esther Christiansen's foundation.

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Factors Associated with Long-term Progression or Stability in Exfoliation Glaucoma

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Purpose: To evaluate intraocular pressure (IOP) reduction with long-term progression or stability in exfoliation glaucoma patients.

Methods: Patients (from Greece, Spain, Russia and Hungary) were analyzed in a multicenter, retrospective analysis with at least five years of follow-up and were stable or had progressed after the beginning of the follow-up period.

Results: 167 patients (n = 85 stable, n = 82 progressed) were included in this study. The mean IOP in the stable group was 18.1 ± 2.6 and 20.1 ± 4.3 mm Hg in the progressed group ($P = 0.0005$). The mean follow-up time for the stable group was 6.1 ± 2.3 and 3.4 ± 1.7 years for the progressed group. The standard deviation for each individual patient's average IOP for the stable group was 2.9 and 4.6 mm Hg for the progressed group ($P < 0.001$). Patients who had a mean IOP of ≤ 17 mm Hg progressed by 28%, those with an IOP of 18-19 mm Hg progressed by 43%, while patients with an IOP of ≥ 20 mm Hg progressed by 70%. Progressed patients at baseline had statistically greater optic disc damage, more medicine changes and trabeculectomies during follow-up than stable patients ($P < 0.05$).

Conclusion: This study suggests that IOP reduction helps to prevent glaucoma progression in patients with exfoliation glaucoma, although it does not guarantee the prevention of worsening of the disease.

Commercial Relationship: A.G.P. Konstas, None; G. Hollo, None; Y.S. Astakhov, None; M.A. Teus, None; E.L. Akopov, None; W.C. Stewart, None.

Support: Sponsored by an unrestricted grant from Pharmacia and in part by an unrestricted grant from Research to Prevent Blindness, Inc. Study was supported in part by the Hungarian National Health Research Grant ETT 293/2000 (Dr. Hollo) and an ENTER grant from the EU (Dr Konstas).

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ABSTRACTS

Friday, September 6: 16:10-17:30

SESSION 2

Angle closure glaucoma

Moderators: *Paul Foster and John Thygesen*

New Danish Guidelines for Primary Angle Closure

Svend Vedel Kessing, MD, DMSc and John Thygesen MD

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Purpose: In 1997 we published the Danish Guidelines on Primary Open Angle Glaucoma (POAG). The guidelines were based upon terminology, definitions and classifications of POAG and ocular hypertension aiming at a specific therapy. In many aspects the format was used as a model for the European guidelines 1998. As a follow-up we now present the new Danish Guidelines on Primary Angle Closure (PAC) and PAC Glaucoma (PACG).

Motivations for the publication:

1. Subclinical creeping synnechial angle closure occurs in 2/3 of PAC cases.
2. Different mechanisms and stages of PAC need different treatments.
3. The conventional terminology and management in PAC(G) lacks consistency in the view of 1 and 2 and the term glaucoma is still used in cured PAC without signs of glaucoma.
4. “Trial and Error” treatment of PAC(G) is most often the clinical practice.

Methods:

Based upon clinical experience and literature we suggest the following:

1. *Objective methods for detection, classification and diagnosis.*
 - a. Van Hericks limbal chamber depth method for detection.
 - b. Standardized PAC gonioscopy combined with axial chamber depth (ACD) measurement for classification and diagnosis.
 - c. Indentation gonioscopy with evaluation of the iris mobility to distinguish between pupillary block and plateau iris mechanism in addition to the ACD measurements.
2. *An objective based, differentiated terminology to reflect the different mechanisms and stages of PAC. A specific treatment is adapted to each term.*

The term glaucoma is only used in the stages with permanently elevated IOP with or without structural/functional defects.

The PAC group with plateau-iris will be used to demonstrate the sub-classification of the main groups. The differentiated stage terminology with definitions and the adapted specific treatment will be presented.

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The classification of angle-closure glaucoma in epidemiological research

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The traditional classification of angle-closure glaucoma places emphasis on symptoms of disease, recognising acute, sub-acute, chronic and latent disease. There is no differentiation between disease with or without glaucomatous optic neuropathy.

Consequently, angle-closure glaucoma is, by definition, an anterior segment disease that may or may not be associated with loss of vision. This is inappropriate for epidemiological purposes, where pooled data on prevalence and incidence are used as an index of visual loss and blindness. It is also inconsistent with the growing emphasis of the use of the term “glaucoma” to indicate optic neuropathy.

Ideally, the classification of a disease should categorise the process according to the best current understanding of its natural history, differentiating between stages of the disease that influence the risk of loss of sight. At a clinical level, the ultimate aim of a classification scheme is to guide the logical, timely use of medical, laser or surgical intervention. On an international level, symptomatology has been shown to be a poor guide to the presence and severity of angle-closure.

There is a need to revise the traditional classification to recognise three stages of angle-closure; namely- the presence of significant risk factors for closure (angle-closure suspect), evidence of irido-trabecular apposition (angle-closure- with or without synechiae) and the combination of angle-closure and glaucomatous optic neuropathy (angle-closure glaucoma).

In order, to guide appropriate intervention, the mechanism of closure needs to be specified. Ritch's scheme is currently the most appropriate for this purpose, identifying pupil-block, plateau iris, lens-related causes, and closure due to factors posterior to the lens. The use of these two schemes in parallel, to grade severity of disease, and to guide management, will promote a more logical approach toward research into angle-closure.

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**Anterior chamber depth measurement by optical pachymetry:
Systematic difference using the Haag-Streit attachments no. I
for corneal thickness & II for chamber depth versus attachment
no. II alone.**

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Purpose: Haag-Streit recommends that for the most accurate anterior chamber depth (ACD) results, the corneal thickness, as determined with attachment No. I, should be deducted from a measurement from corneal epithelium to the anterior lens surface, made with attachment No. II (Method A). Often ophthalmologists use the measurement made from the corneal endothelium to the anterior lens surface, using only attachment No. II (Method B), which is a simpler and faster method. This study examined agreement between Methods A and B.

Methods: Two studies were conducted independently by each author. RRB measured 109 subjects (30 men, 79 women; mean age, 61.3 years) consecutively from a population-based glaucoma survey based in Rom Klao, Thailand. PHA measured 127 (27 men, 100 women; mean age, 66.9 years) consecutive Danish patients referred for evaluation due to possible angle closure.

Results: Using Method A, mean ACD was 2.59mm (SD, 0.27) in the Thai study and 1.97mm (SD, 0.29) in the Danish study. ACD measured with Method B was significantly ($P<0.001$) deeper than Method A in both studies (Thais: difference=0.166mm [95%CI: 0.158-0.174]; Danes: difference=0.118 [95%CI: 0.109-0.127]). With an increase in ACD of 1mm, the methodological difference increased by 0.052mm (regression formula: difference (B-A)=0.0667 x Mean ACD – 0.0148; $R^2=0.31$). This positive correlation did not differ significantly between the two studies.

Conclusions: The relevance and importance of estimating ACD as a risk factor in primary angle closure glaucoma suspects and patients has been repeatedly emphasized. This is the first empirical study to quantify the difference in ACD using these two methods in two samples, one clinic-based (angle closure suspects) and the other population-based. The size of the methodological difference has a level that corresponds to the age reduction of ACD per decade, or to about 6% of ACD in a given eye. These findings highlight the importance that clinicians recognize that these two methods will give different results and recommend that one should standardize ACD measurements using the Haag-Streit optical pachymeter.

Commercial Relationship: None

Support: The Rom Klao Glaucoma Survey was supported by the British Council for the Prevention of Blindness, London, England, and the Glaucoma Research Fund, Department of Ophthalmology, Chulalongkorn University, Bangkok, Thailand.

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Primary angle closure glaucoma in Greenlanders. An overview

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Purpose: To present a short survey of population based studies, preventive measures and treatments for primary angle closure glaucoma (PACG) in a high- risk population. Greenland has 56,000 inhabitants. About 89% are born in the country and closely related to Inuit populations of N-America and East Asian Mongoloids, with European admixture over centuries. Mean life expectancy is 63 years in men and 69 in women.

In 1962 a blindness survey showed glaucomas to be responsible for 64% of all blindness. In 1968 PACG was found to be the major glaucoma problem. Prevalence was estimated at 5.1% in women and 1.6% in men aged 40+. Population studies using gonioscopy, optical measurements of anterior chamber depth, corneal thickness, - diameter, and - curvature as well as ultrasound biometry were gradually performed. Main findings were eye traits clearly associated with increased risk of angle closure glaucoma: a shallow anterior chamber depth and small corneal diameters. A high heritability (70%) of these eye dimensions was found. District medical officers have currently been informed and trained in early PACG detection and treatment with some success. All districts have tonometers and slit lamps.

From an early phase surgical iridectomies and later YAG-laser iridotomies were introduced as routine procedures by travelling consultants and at the referral centre, Rigshospitalet in Copenhagen. In 1993-96 a well-equipped surgical eye clinic was established in the capital Nuuk, also introducing phakoemulsification cataract surgery and YAG/Argon-laser equipment.

Results: In 1999 blindness due to glaucomas had fallen to about 9% of the registrations in Greenland. From 1999 an outreach model had to be established again, including 2 consultant teams covering the 16 districts in 45 weeks by one visit per year, equipped with YAG lasers. Surgical cataract teams were sent out 3 x 3 weeks per year performing decentralised phako-surgery. Due to economic constraints this programme was reduced from 2002 to consultants in only 31 weeks and only two surgical tours. Totally 104 YAG laseriridotomies and 179 cataract operations were performed in 2002.

From 1997 Rigshospitalet has functioned again as referral centre for complicated glaucoma cases from Greenland. For the last 2 years glaucoma treatments have involved: 19 cataractoperations in patients with angle closure, 28 YAG iridotomies, 9 cyclodiodelaser treatments, and 4 trabeculectomies.

Conclusion: Although the high-risk anatomy of PACG is still prevalent in the older population of Greenland, modern treatment possibilities – YAG iridotomies and cataract operations - have prevented blindness in most cases. Future developments towards a changing refractive pattern with more myopia will probably reduce the risk of PACG in the population.

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ABSTRACTS

Saturday , September 6: 9:15- 11:15

SESSION 3 Imaging and Psychophysics

Moderators: *Carlo Traverso and Ted Garway-Heath*

Introductory papers: (No abstracts)

Ophthalmoscopy versus imaging for glaucoma diagnosis: Pros and cons.

Jost Jonas

University Eye Clinic of Mannheim, Germany

Does imaging parallels psychofisics in glaucoma?

Michele Iester

Clinica Oculistica Di.N.O.G. University of Genova, Italy

Fixed-angle and customised corneal-polarisation compensation for scanning laser polarimetry: comparison and correlation with function

Holló G, Katsanos A, Kóthy P

st 1 Department of Ophthalmology Semmelweis University, Budapest, Hungary

Purpose: To investigate the differences between the results of scanning laser polarimetric (SLP) measurements of the retinal nerve fibre layer thickness (RNFLT) made using two different corneal-polarisation techniques; customised (SLP-C), and fixed-angle (SLP-F) compensations.

Methods: Both SLP-C and SLP-F were performed on 37 consecutive phakic patients with chronic open-angle glaucoma, and on 14 healthy control subjects. One randomly-selected eye per subject was evaluated.

Results: Both SLP-C and SLP-F parameters were able to discriminate between the glaucoma group and the control group; except in the case of the ellipse modulation, which differed significantly between the two groups with SLP-C ($p=0.017$), but not with SLP-F ($p=0.056$). When SLP-C and SLP-F values were compared, inferior maximum thickness and ellipse standard deviation were significantly lower with SLP-C in both groups ($p<0.05$ for each parameter). Superior maximum thickness was significantly lower in glaucoma with SLP-C than with SLP-F ($p=0.006$) and tended to be lower with SLP-C than with SLP-F in the control group ($p=0.053$). In the glaucoma group it was only with SLP-C that a significant (positive) correlation between the superior maximum thickness and the inferior hemifield mean sensitivity (MS) ($r=0.653$, $p<0.001$), and between the inferior maximum thickness and the superior hemifield MS ($r=0.420$, $p=0.023$) was found. The other global and sectoral SLP parameters showed significant correlation with the corresponding visual field parameters with both techniques.

Conclusion: Our findings suggest that SLP measurements with customised compensation provide more realistic results for RNFLT than those made with the conventional fixed-angle compensation.

Commercial relationship: G. Holló: None, A. Katsanos: None, P. Kóthy: None

Support: ETT 293/2000 (G. Holló)

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The nerve fiber layer symmetry test: An automated evaluation of the human retinal nerve fiber layer thickness as measured by optical coherence tomography

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²Department of Ophthalmology, Malmö University Hospital, Sweden.

Purpose: To present and test a new interpretation concept, the Nerve fiber layer Symmetry Test (NST), for automated evaluation of retinal nerve fiber layer thickness (RNFLT) as measured by optical coherence tomography (OCT) in glaucoma.

Methods: In a pilot study, 32 healthy and 40 age-matched glaucomatous eyes were included and examined by OCT, computerised perimetry, RNFL/disc photography, tonometry, and a general ophthalmologic examination.

Results: The observed NST specificity/sensitivity was 100%/95%, and 97%/100% after statistically correcting the OCT RNFLT for being thinner with lower OCT signal-to-noise ratio. The corresponding 8% and 10% improvements in sensitivity compared to the single most sensitive traditional OCT RNFLT parameters were not statistically significant in this small study. Mean Deviation was -5.8 dB (-30.1 to 0.7; median(range)) in the 38 glaucomatous eyes where a threshold visual field test was performed.

Conclusion: The NST showed great potential for screening purposes with very high specificities and sensitivities for detection of RNFLT attenuation indicating early to severe glaucoma. Although the results of this small pilot study were very promising, the NST needs to be validated in larger samples, in different age groups, and in different types and stages of glaucomatous RNFL damage.

Commercial Relationship: J.L. Hougaard, None; A. Heijl, None; E. Krogh, None.

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The impact of POAG definition on the cross-sectional assessment of HRT diagnostic validity

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Purpose: To determine the impact of the several definitions of POAG reported in the literature on the cross-sectional assessment of HRT clinical validity.

Methods: A detailed search on Medline (from 1992 to 2002) has been conducted in order to identify the definitions of POAG. The following key words were used: glaucoma + HRT, OCT, GDx, RTA, SLO, FDT. 154 papers have been retrieved and 102 papers have been considered for the purpose of the study. Several different ³visual field based² POAG definitions have been counted and 8 were used for this study. A sample of 193 normal subjects, 222 POAG suspects and 103 POAG patients who underwent the HRT examination and a 24 II HFS visual field examination has been used to assess clinical validity of HRT. In our sample the definition of POAG was based on the presence of GHT out of normal limits and CPSD > 2 dB, and IOP > 21 mmHg. The visual fields have been re-analysed and categorised according to the 8 more common definitions of POAG reported in the literature. For study purposes, IOP was considered to be part of the 8 different definitions of POAG, whereas optic disc appearance was not included. The sensitivity and specificity of each scenario have been calculated by means of standard procedures.

Results: Excluding the POAG suspects, with the AGIS sensitivity was 0.51 and specificity 0.95. With the 3 adjacent points sensitivity was 0.61 and specificity 0.93. With the 3 adjacent point + GHT sensitivity was 0.73 and specificity 0.94. With the 3 adjacent points + CPSD > 2 dB sensitivity was 0.67 and specificity 0.94. With the 3 adjacent points + MD < -2 dB sensitivity was 0.67 and specificity 0.94. With MD < -2 dB sensitivity was 0.54 and specificity 0.94. With GHT out of normal limits sensitivity was 0.70 and specificity 0.94. With CPSD > 2 dB sensitivity was 0.59 and specificity 0.94. With GHT and CPSD, sensitivity was 0.81 and specificity 0.94. When including POAG suspects the diagnostic validity was much lower.

Conclusions: Definition of POAG is crucial in assessing the diagnostic validity for detecting glaucoma. The most commonly used VF based definitions of POAG gave rise to almost identical levels of specificity and to substantial differences in terms of sensitivity of the HRT examination when using a same large sample of normal subjects and POAG patients. A standard definition of POAG is needed in order to make diagnostic investigations on the same or different systems more accurate and better comparable.

Commercial Relationship: S Miglior, None; M Guareschi, None; E Albe¹, None; F Romanazzi, None; S Gomasasca, None; N Orzalesi, None.

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The Relationship between Heidelberg Retina Tomograph Defined Rim Area and Visual Field Sensitivity

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Purpose: The Weber-Fechner law, whereby a subject's psychological perception of a physical stimulus (eg light) is proportional to the logarithm of stimulus intensity, has influenced the adoption of a logarithmic, decibel (dB) scale in measuring differential light sensitivity (DLS). It has been suggested that a linear, 1/Lambert scale may be a more appropriate scale for measuring visual function. The relationship between the change in optic disc rim area as measured using the Heidelberg Retina Tomograph (HRT) and change in DLS (in both dB and 1/Lambert) over time was examined in order to identify which scaling system is most appropriate for identifying glaucomatous progression.

Methods: 17 eyes of 17 subjects at risk of glaucomatous progression were examined at 4-6 monthly intervals over a mean follow-up of 68 months. At each visit 24-2 Humphrey automated perimetry and Heidelberg Retina Tomograph (HRT) optic nerve imaging was performed. The rim area and DLS (both dB and 1/Lambert) were calculated for both the global disc/full field and for the HRT Explorer defined disc sectors and their corresponding field segments. Change in DLS (y-axis) was plotted against change in rim area (x-axis). For an equivalent rate of decay between change in rim area and change in DLS (both dB and 1/Lambert) a slope value of 1.00 was expected.

Results: There were significant correlations ($r^2 > 0.1$, $p < 0.05$) between change in global rim area and change in 1/Lambert DLS in 5 subjects, with a median slope value of 2.45. There were 4 significant correlations when the dB scaling was used with a shallower median slope, 0.5. Of the individual disc sectors, the inferotemporal was identified as demonstrating the most significant correlations. The inferotemporal sector's median slope value (0.92) most closely approximated the predicted value of 1.00.

Conclusions: There is a wide variation of visual field sensitivity change compared to rim area change over time. In the linear scale the slope values are steeper than expected indicating an apparent faster change in visual field compared to rim area over time. The reverse was observed using the logarithmic scaling where the slope values were less than 1.00. The variation may be due to structure/function disociation over time, functional reserve in the disc or conformational changes involving non-functioning supporting tissue.

Commercial Relationship: NG Strouthidis, DF Garway-Heath; Heidelberg Engineering

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Automated Classification of the Optic Nerve Head for Glaucoma Screening

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Purpose: To evaluate a method for automated glaucoma classification.

Method: *Automatic outlining of the ONH:* Outlining was carried out using the reflectivity images of the scanning Laser ophthalmoscope HRT I (Heidelberg Engineering, Germany). As the optic disk is of elliptical shape, the possible ONH margin was limited to a family of controlled continuity splines, known as active contours. The final contour was found by balancing the internal and external forces. The automatic outlined ONH margin was imported into the HRT database. The morphological parameters were calculated by regular HRT software (v.2.01). *Classification:* Automatic classification was based on morphological parameters. Three different automatic classifiers were used: linear discriminant analysis (LDA), classification trees (CTREE) and improved classification trees by bootstrap aggregation (bagging). The bias corrected 0.632+ bootstrap estimator was used to estimate the misclassification error, i.e. the proportion of incorrect classified subjects in percent. Each estimator was computed using 50 bootstrap replications. *Patients:* We evaluated 159 eyes of a case-control study. The subjects in the control- and glaucoma-group were matched by age and sex. The control group contained 77 subjects, the glaucoma-group 82 patients.

Results: In 83% of eyes the automatic outlined ONH margin showed good coincidence with the manually outlined ONH margin. The error rate estimation (ERE), the sensitivity (SE) and specificity (SP) of automated glaucoma classification was 22.2% (ERE), 85% (SE), and 58% (SP).

Conclusion: The automated classification achieved 77.8% of estimated correct classification.

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Correlation of Visual Field Sensitivity and Retinal Nerve Fibre Layer Thickness as Measured by Scanning Laser Polarimetry

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²Department of Ophthalmology, Bascom Palmer Eye Institute, Miami, FL; ³Glaucoma Division, Jules Stein Eye Institute, Los Angeles, CA.

Purpose: to evaluate the strength and pattern of the correlation between visual field (VF) sensitivity and retinal nerve fibre layer thickness (RNFLT) measurements by scanning laser polarimetry with variable (eye-specific) corneal compensation.

Methods: 54 eyes of 54 normal subjects (mean $\pm$ standard deviation: age 42 ± 15 years, VF mean deviation (MD) -0.69 ± 1.01 dB) and 51 eyes of 51 glaucoma patients (age 66 ± 14 years, VF MD -6.92 ± 5.43 dB) were imaged with a scanning laser polarimeter with a prototype variable corneal compensator. Images were acquired with two compensator settings: fixed (population mode) "FCC" and variable (eye-specific) "VCC". VF pointwise sensitivity was recorded in dB ($\text{dB} = 10 \cdot \log [1/L]$) and 1/L scales. Linear and logarithmic correlations were sought between global and sectoral (Garway-Heath et al, Ophthalmology 2000) VF sensitivity (dB and 1/L scales) and RNFLT measurements. Correlations of VF sensitivity and RNFLT with age were also sought in normal subjects.

Results: Both VF sensitivity ($p < 0.001$) and RNFLT ($p = 0.005$) declined with age. VCC global ($R^2 = 0.49$) and sectoral ($R^2 = 0.00$ to 0.47) RNFLT correlations with VF sensitivity were significantly greater than FCC global ($R^2 = 0.12$) and sectoral ($R^2 = 0.00$ to 0.21) correlations. There was no correlation between VF sensitivity and RNFLT in the temporal sector. The strongest relationship was found in the supero-nasal sector. Logarithmic regression of dB VF sensitivity against RNFLT was significantly better than linear regression, except for the supero-nasal sector. Linear regression of 1/L VF sensitivity against RNFLT was significantly better than logarithmic regression for all sectors. R^2 values for 1/L linear regressions were generally greater than dB logarithmic regressions.

Conclusions: RNFLT measurements by scanning laser polarimetry with variable (eye-specific) corneal compensation correlate well with VF sensitivity. Correlations were linear with the 1/L scale for VF sensitivity and curvilinear (logarithmic) with the dB scale. R^2 values were higher with the 1/L scale.

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Saturday, September 6:

11:45 – 13:00: SESSION 4	<i>What are appropriate Target pressures?</i>
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Moderators: *Clive Migdal and Stefano Miglior*

No abstracts

Introduction..... *Clive Migdal , UK*

Target IOP – Concept and definition..... *Steve Vernon, UK*

Role of IOP in Glaucoma Pathogenesis *Francisco Goni, Spain*

**How to estimate a target IOP
figures and formulations** *Augusto Azuaro-Blanco,UK*

**Evidence that target IOP makes a
difference - the proof of the pudding** *Stephano Gandolfi, Italy*

Discussion

Summary and take-home points*Stefano Miglior, Italy*

13.00 - 14.00 ***Lunch***

ABSTRACTS

Saturday , September 6: 14:00-15:30

SESSION 5

**How best to achieve our Target Pressures:
Medical treatment, Laser, NPDS or Fistulising
surgery? Wound healing.**

Moderators: *Franz Grehn and Peng Khaw*

Does the site of filtration influence the medium to long-term Intraocular Pressure control following filtering surgery?

Negi AK, Kiel W, Vernon SA.

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Purpose: To evaluate the influence of varying surgical site on the medium to long-term Intraocular Pressure (IOP) control in patients undergoing unenhanced small flap trabeculectomy (microtrabeculectomy).

Methods: Analysis of results from two cohorts of patients that underwent unenhanced microtrabeculectomies at different sites by a single surgeon (SAV). The first cohort of 17 eyes was part of a trial to study the astigmatic effect of microtrabeculectomy (results published elsewhere) and all had flaps centred at the 12 o'clock meridian. The second cohort included 28 eyes with flaps created on either side of the 12 o'clock, i.e. superonasal in the 13 left eyes and superotemporal in the 15 right eyes. All case notes were reviewed for the preoperative and presenting IOPs, the number and duration of antiglaucoma medication use pre and post-operatively, any intraoperative, early or late post-operative complications. All IOPs measured at 6 months and then yearly intervals were recorded. The baseline characteristics and IOPs at each follow-up point in time were compared between the groups and the left and right eyes of the non-12 group up to a maximum of 72 months. Survival was assessed by the site of microtrabeculectomy, with failure considered as any IOP above 22 and 15 mm Hg with or without medications.

Results: All patients had a minimum follow up of 24 months and 12 patients in the 12 o'clock group and 17 in the non-12 group completed the full follow up of 72 months. The IOPs at all points in time after the first 6 months were statistically significantly lower in the non-12 o'clock group compared to the 12 o'clock group. The mean IOPs at the last follow up were 13.3 and 16.0 mm Hg in the two groups (p value= 0.03) with a smaller mean number of drops in the non-12 group (0.400 vs. 0.706). Subanalysis of non-12 group eyes revealed lower IOPs in the left eyes with superonasal flaps. Kaplan-Meier curves showed significantly better outcome in the superonasal group.

Conclusions Eyes with superonasal flaps achieve and maintain lower IOPs when compared with both the superotemporal flaps in the right eyes and flaps positioned at 12 o'clock. The results suggest that to achieve a lower target IOP the site of trabeculectomy fistula should be superonasally sited. Further prospective studies are needed to investigate a similar influence of changing site on IOP reduction with standard and antimetabolite-enhanced trabeculectomies.

Commercial relationship – none

Support – none

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TGFb in ocular wound healing : TGFb signalling in primary human tenon fibroblasts and evaluation of TGFb regulated PAI-1 in different glaucoma subgroups

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Purpose: Postoperative scarring represents a major complication after trabeculectomy. In search of predictive markers for surgical outcome, increased concentrations of the protein Transforming growth factor beta (TGFb) in the aqueous humor seem to correlate with increased scarring risk of the bleb. We investigated the effect of TGFb isoforms on primary human tenon fibroblasts (HTF) and the fibroblast cell line NIH 3T3 with special regard to ocular wound healing.

In addition we analysed Plasminogen activator inhibitor 1 (PAI-1) concentrations, a TGFb regulated gene, which leads to a decreased degradation of extracellular matrix (ECM), in different glaucoma subgroups and evaluated its clinical significance in bleb development.

Method: TGFb receptor status of primary human tenon fibroblasts (HTF) cultures were assessed by RT-PCR and immunohistochemistry. HTFs and NIH 3T3 cells were stimulated with different concentrations of TGFb isoforms and activin A for various time periods. Activation of the SMAD signalling pathway and MAPK signal transduction was determined by western blot using phosphospecific antibodies. In respect to ocular wound healing, HTFs were stimulated for 2-3 days and the synthesis of alpha smooth muscle actin as well as fibronectin was measured by RT-PCR and western blot.

In a prospective study 21 patients with Primary open angle glaucoma (POAG), 14 patients with Exfoliation glaucoma (XFS) and 18 control patients (cataracts) were recruited. 100-160 µl of aqueous humor were sampled at the beginning of surgery and analysed for Plasminogen activator inhibitor 1 (PAI-1) using a commercial available ELISA kit (American diagnostica Inc.)

Results: Stimulation of fibroblasts with TGFb resulted in rapid phosphorylation of SMAD2 signalling protein (15 – 30min). In NIH 3T3 cells SMAD activation was sustained (more than 6h), whereas in HTFs it was only temporarily seen (up to 2h). Beside the SMAD pathway, the MAPK pathways ERK and p38 were activated by TGFb in HTFs and NIH 3T3 cells. Stimulation of HTFs for 2-3 days resulted in an induction of alpha smooth muscle actin and fibronectin.

PAI-1 was found to be statistically significantly increased in POAG (p= 0.29) and XFS (p= 0.01) as compared to the control (Student t-test) Mean values cataract: 2.55 +/- 0.52 µg/ml, POAG: 2.91 +/- 1.34 µg/ml, XFS: 4.38 +/- 2.77 µg/ml.

Conclusion: TGFb effects on primary human tenon fibroblasts are complex – on the cellular level SMAD signalling cascade as well as MAPK signalling pathways are activated, leading to increased expression of alpha smooth muscle actin as well as fibronectin, both proteins which play pivotal roles in the process of wound healing.

Besides TGFb, also PAI-1 seems to be upregulated in glaucomatous eyes and could possibly represent a prognostic marker for the scarring risk of blebs.

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Postoperative Mitomycin For Primary Trabeculectomy

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Purpose: To assess the efficacy of a new application technique of mitomycin to enhance the outcome of filtering surgery in cases of uncontrolled glaucoma in eyes without previous filtering surgery.

Methods: This is a prospective, randomized clinical trial. Forty-two consecutive patients scheduled for glaucoma surgery in one large surgical center were included on a consecutive basis. Patients underwent routine trabeculectomy. On the day of surgery, the surgeon was not aware to which of the two groups a patient belonged, nor was the study supervisor. In group 1, mitomycin (0.05mg/ml) was applied topically to the filtering bleb on the three days after surgery (postoperative application). In group 2, no mitomycin was applied. Pre- and post- operative IOP values, visual acuity, the need for antiglaucomatous medication, previous surgical procedures and the need for further surgical interventions were monitored.

Results: Sufficient follow-up data was available from all patients in both groups (100%). Mean follow- up was 8.5 months (range, 4-14 months) and 8.7 months (range, 2-19 months), respectively for groups 1 and 2. The mean IOP decreased from 30.5 ± 10.2 mmHg to 14.8 ± 2.8 mmHg in group 1 and from 23.1 ± 7.1 mmHg to 16.3 ± 4.1 mmHg in group 2. The mean visual acuity changed from 0.42 to 0.47 (decimals) in group 1 and from 0.46 to 0.45 in group 2. The average amount of medications decreased from 2.3 ± 1.1 to 0.1 ± 0.4 in group 1 and from 2.3 ± 1.0 to 0.7 ± 1.1 in group 2. The difference in the need for topical antiglaucomatous therapy at the last follow-up was significant ($p=0.02$, t-test). Complications such as failures and the need for further surgical procedures occurred once in group 1 and four times in group 2 (not significant, Mann-Whitney test). Enhancement procedures such as suture lysis and revision of the filtering bleb were infrequent and not different between the two groups. Postoperative hypotony (IOD of less than 5mmHg) was frequent with 13 cases in group 1 and 11 cases in group 2. No case of hypotony maculopathy developed.

Conclusions: The postoperative application of mitomycin made no change when compared to no application in terms of surgical failures. The need for further antiglaucomatous therapy (complete surgical success vs. qualified surgical success) seemed to be larger in the non- mitomycin treated group. This application of mitomycin does not increase the rate of complications, but it does as well not reduce the amount of failures.

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Postoperative Mitomycin For Complicated Trabeculectomy

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Purpose: To assess the efficacy of a new application technique of mitomycin to enhance the outcome of filtering surgery in cases of complicated glaucoma.

Methods: Prospective, randomized clinical trial. Fifty consecutive patients scheduled for glaucoma surgery in one large surgical center. Patients underwent routine trabeculectomy. In group 1, mitomycin (0.05mg/ml) was applied topically to the filtering bleb on the three days after surgery (postoperative application). In group 2, mitomycin (0.2mg/ml) was applied to a sponge during surgery (intraoperative application). Pre- and post- operative IOP values, visual acuity, the need for antiglaucomatous medication, previous surgical procedures and the need for further surgical interventions were monitored.

Results: Sufficient follow-up data was available from 24/25 patients in group 1 and from all 25 patients in group 2. Follow- up was 18.2 and 16.4 months, respectively. The mean IOP decreased from 27.3mmHg to 16.1mmHg in group 1 and from 29.0mmHg to 17.5mmHg in group 2. The average amount of medications decreased from 2.3 and 2.3 to 0.9 and 0.8 ($p<0.68$; t-test) in groups 1 and 2 at the last visit. Success rates and complications were not significantly different between the two groups. Hypotony was more frequent in group 2, where the only case of hypotony maculopathy occurred. The rate of loss of visual acuity of more than two lines was higher in group 2. Failures were more frequent in group 2 (7/25) as compared to group 1 (1/24) ($p<0.045$, Log-Rang test).

Conclusions: The postoperative application of mitomycin was similarly effective as compared to the intraoperative application. It appears that the postoperative application of mitomycin following trabeculectomy is associated with a lower risk of complications in eyes with complicated forms of glaucoma.

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Vision preservation in patients with end-stage glaucoma following trabeculectomy with mitomycin

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Purpose: To study the results of the early postoperative period in patients with end-stage glaucoma following trabeculectomy with mitomycin.

Design: Prospective case-series.

Methods: The study included prospectively 20 consecutive patients (20 eyes) with end-stage glaucoma operated by the same surgeon (F.T.) with trabeculectomy and mitomycin-c (0.3mg/ml, application time 3 minutes). End-stage glaucoma was defined based on visual field results. Inclusion criteria required a preoperative visual field result presenting Advanced Glaucoma Intervention Study score over 16 or a visual field result with split to fixation. The patients were included in the study preoperatively and were followed prospectively. The following parameters were studied: the intraocular pressure (IOP) and the number of glaucoma medications preoperatively and at 1 week, 1 month and 3 months postoperatively and visual acuity (LogMAR, ETDRS charts) and mean deviation (30-2 Full Threshold visual field test, Humphrey 750 perimeter software A10.1) preoperatively and at 3 months postoperatively. Hypotony was defined as the measure of IOP of less than 5 mmHg. The hypotony was considered as transient when the duration was less than 15 days. The incidence of the intraoperative and postoperative complications such as flat anterior chamber, macular edema, choroidal detachment and bleb leaking (seidel) was recorded. Paired-2-sided t test was used to compare the pre- and postoperative values.

Results: Mean age was 65.25 years (range 31-80). Mean follow-up time was 120.7±82.9 days (range 30-326 days). Seven patients were blind in one eye at presentation (in 6 of these patients vision loss in the other eye was due to glaucoma). The mean preoperatively IOP was 28.45 mmHg ±8.23, which was reduced postoperatively at 1 week, 1 month and 3 months to 14.57 ±7.37 ($p<0.0001$), 12.33 ±4.20 ($p<0.0001$) and 12.94 ± 6.09 ($p<0.0001$) respectively. Preoperatively the mean visual acuity was 0.67 LogMAR ±0.55 (ETDRS charts) and the mean value of the mean deviation at the visual field test was -25.23 ±6.78. Three months after surgery there was no statistically significant difference in visual acuity (0.59 LogMAR ±0.56, $p=0.37$) and mean deviation (-24.95 ±6.79, $p=0.44$). There were no intraoperative complications, while 4 cases presented positive seidel and concomitant transient hypotony. The number of preoperative glaucoma medications was 2.95 ±0.94 which was reduced to 0.75±1.11 ($p<0.0001$) three months after surgery.

Conclusions: In our case-series of consecutive patients with end-stage glaucoma, trabeculectomy with the adjunctive use of mitomycin-c reduced effectively the IOP and preserved the vision 3 months postoperatively.

Commercial Relationship: F. Topouzis, A. Koskosas, Th. Pappas, E. Anastasopoulos, L. Mavroudis, None. Support: None

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Modulating Matrix Metalloproteinases Prevents Scarring and Failure of Glaucoma Filtration Surgery

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Background

The control of matrix remodeling and contraction is a critical component of the scarring process after glaucoma filtration surgery. The ability to modulate this process would give considerable control over the entire wound healing sequence.

Methods

Cell culture, new imaging methods of cells in matrix collagen contraction experiments and in vivo experimental model of glaucoma filtration surgery.

Results

Modulation of matrix metalloproteinases results in a profound change in cellular behaviour in vivo and in vitro. In the vitro model, a viable experimental model is greatly prolonged with marked reduction of scar tissue.

Conclusion

Modulation of matrix metalloproteinases is a exciting new modality for the prevention of post operative scarring in the eye and potentially elsewhere in the human body.

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Double Molteno Implant in Refractory Glaucoma: Long term results

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Purpose: To assess long-term safety and efficacy of the Double Plate Molteno Implant in refractory glaucoma.

Methods: Two hundred consecutive patients suffering from refractory glaucoma received a double plate Molteno implant between 1989 to 2001 by the same surgeon using similar surgical technique. Follow up ended on April 2003. Kaplan Meyer survival analysis comparing the main diagnostic groups were plotted as main complications were analyzed.

Results: Neovascular glaucoma (40%), aphakia (18.5%), previous failed filters(10.5%), and congenital-juvenile glaucoma (9.5%), were the main diagnostic groups. IOP was controlled <21 mmHg in 89% of the eyes (mean IOP 15.2 ± 6.3). Mean preoperative medication dropped from 3.2 to 0.4. Neovascular glaucoma was the group which disclosed more severe complications.

Conclusion: Double plate Molteno Implant is an effective filtering surgical technique in a long term basis. This technique appears useful in most types of refractory glaucoma.

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Cyclodiode: Long-term IOP and acuity results of treatment utilising a standard protocol

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Purpose – To analyse the long-term results of intraocular pressure (IOP) reduction and visual retention in refractory glaucoma following contact cyclophotocoagulation with the IRIS diode laser utilising a repeatable standard protocol.

Method – A cohort analysis of all patients from our first published series who had undergone cyclophotocoagulation with a standard protocol using the IRIS G-probe (14 applications of 2000mW x 2000ms over 270 degrees) in whom a minimum follow up of 3 years was achieved. Details of IOPs and recorded acuities were considered the primary end-points for this analysis.

Results – 43 eyes of 40 patients were followed for 36 – 84 months (mean 65.9 months) after the initial cyclodiode treatment (between April 1994 and May 1997). Mean (SD) pre-treatment IOP was 31.6 mmHg (8.8) reducing at final index visit to 16.7 mmHg (11.7) ($p < 0.0001$). The mean antiglaucoma medication score per eye was not significantly reduced long-term (1.60 (0.76) pre-treatment to 1.56 (1.32) at last index visit. However, the number of patients taking Acetazolamide was significantly reduced from 93% pre first treatment to 16.3% at final index visit. 58.1% of eyes required more than one treatment and the overall mean number of treatment sessions per eye was 2.1 (SD = 1.3)(range 1 - 6). Of eyes with visual acuity 6/60 or better pre-treatment, 19 (44.2%) lost two or more lines of Snellen acuity. Poor visual outcome was associated with poor initial visual acuity, diabetic retinopathy or CRVO. Hypotony (IOP < 5 mmHg) was noted in 2 eyes at the last index visit of which one was secondary to a retinal detachment.

Conclusions – Our simple treatment protocol, repeated if necessary, appears relatively safe and effective at lowering IOP in eyes with refractory glaucoma. Non diabetic eyes with good acuity retained vision well indicating that this form of IOP lowering treatment need not be reserved for eyes with poor visual potential.

Commercial relationship – none

Support – none

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Saturday, September 6:

15:45- 16:00 Tea/Coffee

16:00 -17:30 SESSION 6	<i>How best to organise pan- European studies, collaboration and funding</i>
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Moderators: Roger A Hitchings and Norbert Pfeiffer

No abstracts available:

Introduction.....	 Roger Hitchings, UK
Why we need trials and what can we learn	Anja Tuulonen, Finland
Clinical trials - equating purity with practice...	Richard Wormald, UK
How to set up collaborative trials in Europe....	Zrenner
Economics and trials the need and the reality...	Gisela Kobelt, France
The EGS experiance- The Glaucoma prevention study	Norbert Pfeiffer, Germany
The potential for Industry collaborations	Gunilla Norrgren, Sweden

End of scientific meeting