WORLD GLAUCOMA CONGRESS

World Glaucoma Congress

Vienna July 6-9 2005
Disclaimer

The Association of International Glaucoma Societies (AIGS) organizes the World Glaucoma Congress with the aim of providing education and scientific discourse in the field of glaucoma. The AIGS accepts no responsibility for any products, presentations, opinions, statements or positions expressed by speakers at the congress. Inclusion of material in the scientific program does not constitute an endorsement by AIGS.

Useful telephone numbers

<table>
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<tr>
<th>Service</th>
<th>Telephone</th>
<th>Fax</th>
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<tbody>
<tr>
<td>Registration desk / participant support</td>
<td>(+ 43 1) 931020 - 7101</td>
<td>(+43 1) 931020 - 7110</td>
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<tr>
<td>Message desk</td>
<td>(+ 43 1) 931020 - 7102</td>
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<tr>
<td>Social Desk (hotels, excursions, city information)</td>
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<td>(+43 1) 931020 - 7111</td>
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<tr>
<td>Audio Visual Support - Speaker Ready Room</td>
<td>(+ 43 1) 931020 - 7501</td>
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CME Credits

The World Glaucoma Congress participants may apply for CME credits which are supplied by the following institutions:

1. European Accreditation Council for Continuing Medical Education (EACCME): 21 European credit hours.
2. The New York Eye and Ear Infirmary (NYEEI): this continuing medical education activity has been designated for a maximum of 23 hours of Category I Credit toward the AMA Physician’s Recognition Award.
3. The Österreichische Akademie der Ärzte: 33 Austrian credit points.

The following statements are required for receiving credits through joint sponsoring with the NYEEI:

Course Description & Needs Assessment

Glaucoma patients comprise at least 20% of the patients seen in general ophthalmic practice. With new research findings and the constantly evolving advances in diagnostic and treatment techniques it is imperative that the general ophthalmologist constantly update his/her knowledge in the diagnosis and treatment of glaucoma. In didactic lectures and courses the World Glaucoma Congress, with its faculty of over 130 international glaucoma experts, will address the latest developments in the field of glaucoma.

Learning Objectives

Upon completion of this educational activity, attendees should have a better understanding of the latest developments in glaucoma diagnosis and therapy and be able to apply this knowledge to the treatment of their glaucoma patients, thus providing a higher level of patient care.

Target Audience

General ophthalmologists and glaucoma specialists.

Accreditation Statement and Credit Designation

This continuing medical education activity is jointly sponsored by The New York Eye and Ear Infirmary and the Association of International Glaucoma Societies and has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME). The New York Eye and Ear Infirmary is accredited by the ACCME to provide continuing medical education for physicians. This educational activity has been designated for a maximum of 23 hours of Category I Credit toward the AMA Physician’s Recognition Award. Each participant should only claim credit for the number of hours he/she actually spent in the educational activity.

Disclosure Policy Statement

The New York Eye and Ear Infirmary Institute for Continuing Medical Education requires that each participant/teacher in a CME accredited educational activity disclose the existence of any financial interest and/or other relationship(s) (e.g. paid speaker, employee, paid consultant on a Board and/or Committee for a commercial company) that would potentially affect the objectivity of his/her presentation. Speakers are also asked to make a disclosure that a product is still investigational when an unlabeled use of a commercial product or an investigational use not yet approved for any purpose is discussed during an educational activity. The disclosed information in no way presumes to assess the participant’s qualifications or suitability. The intention is to provide full disclosure of any potential conflict-of-interest, real or perceived, which is related to a specific event. Full disclosure of faculty and commercial relationships, if any, will be made at the program.
Provider Disclosure

The New York Eye and Ear Infirmary Institute for Continuing Medical Education received a financial benefit from the Association of International Glaucoma Societies for accrediting this educational activity. However, The New York Eye and Ear Infirmary has no vested interest in any of the companies sponsoring this educational activity. You are referred to the CME attendance booklet for further information.

“She walks in beauty, like the night
Of cloudless climes and starry skies” . . .

Lord Byron

A thing of beauty is a joy for ever:
Its loveliness increases; it will never
Pass into nothingness; but still will keep
A bower quiet for us, and a sleep
Full of sweet dreams, and health, and quiet
Breathing

John Keats

“The beauty is first of all eternal; it neither comes into being nor passes away; neither waxes nor wanes; next it is not beautiful in part and ugly in part, nor beautiful at one time and ugly at another, nor beautiful in this relation and ugly in that, nor beautiful here and ugly there, as varying according to its beholders; nor again will this beauty appear to the imagination like the beauty of a face or hands or anything else corporeal, or like the beauty of a thought or science, or like beauty which has it seat in something other than itself, be it in a living thing or the earth or the sky or anything else whatsoever; he will see it as absolute, existing alone within itself, unique, eternal.”

Diotima – teacher of Socrates
This continuing medical education activity is jointly sponsored by the New York Eye and Ear Infirmary and the Association of International Glaucoma Societies.

This continuing medical education activity is supported through unrestricted educational grants from Alcon, Allergan, Carl Zeiss Meditec, Heidelberg Engineering, Pfizer Ophthalmics, Ziemer Ophthalmic Systems.

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- **Pfizer Ophthalmics**

**MAJOR SPONSORS**

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19. Ophthalmology Times
20. AIGS/IGR
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NON SMOKING POLICY
Please be informed that the World Glaucoma Congress is a non smoking congress: the congress committees thank all participants to refrain from smoking in the congress venue.

MOBILE PHONES
We kindly request to all participants to keep mobile phones turned off in the conference area and especially in the meeting rooms during the scientific sessions.
Welcome by the President

It is a privilege to welcome you to Vienna and the inaugural World Glaucoma Congress, held under the auspices of the Association of International Glaucoma Societies. This meeting has been made possible by the active involvement and participation of our 63 independent Glaucoma Society members, representing six continents, and our Glaucoma Industry members. For this event, a major effort has been made to provide for both the generalist and the glaucoma specialist an educational and scientific program that is comprehensive, timely, and highly relevant, as well as one that delivers impeccable didactic and scientific quality. Comprised of more than 140 renowned authorities on glaucoma, the Congress faculty for this unprecedented meeting is extraordinary. Their commitment and contributions to enhance glaucoma education and care, as well as their collegiality and dedication to excellence, will be apparent throughout the program. Vienna has been throughout history, and continues to be, an important international destination for landmark gatherings, as we expect this Congress will be. It also is a glorious city with unparalleled cultural activities and entertainment. Therefore, you also should expect a very enjoyable time. On behalf of the Board of Governors and each of our member organizations, I extend to all who have joined us at this memorable event our best wishes for a successful and stimulating meeting.

Professor Robert N. Weinreb
President
Association of International Glaucoma Societies

My speech was this morning . . . . The hall was crowded to the doors. No, Anya, no, you can never imagine the sensation it produced.

F.M. Dostoyevsky
Welcome by the Glaucoma Board of the Austrian Ophthalmological Society and Local Organizing Committee

Dear Colleagues,

Vienna, over centuries a melting pot of various different European cultures, remains a city of dreams, for both body and soul. It is famous for some of the world’s greatest pastries, wonderful coffee houses and wine-makers, a grand opera, theaters and numerous museums; it is the home of Beethoven, Strauss, Schubert and Haydn and besides that, it shows a very important connection to ophthalmology. Vienna is the home of the world’s first ophthalmological clinic. Most of the credit for this development goes to Georg Joseph Beer (1763-1821). In 1805 he performed the first iridectomy for pupilloplasty, not for glaucoma. Based on discussions with his friend Sigmund Freud, who used cocaine in the treatment of the central nervous system, Karl Koller (1858-1944) introduced the use of cocaine as a topical anaesthetic for ophthalmic surgery in 1884.

Another essential knowledge is based on the first description of glaucomatous optic nerve atrophy in 1892 by Isidor Schnabel. Probably the most lasting influence was given by Ernst Fuchs (1851-1926). Working on different fields of ophthalmology he also paid attention to glaucoma. “The consequence of elevated intraocular pressure is a disturbance in blood circulation in the eye […] Elevated intraocular pressure causes compression of the venous system […]” He also described the ‘whip out’ phenomenon of the visual field after glaucoma surgery; he recommended early surgery in advanced cases.

Whereas essential understanding in glaucoma can be found in the past, this meeting will work on a worldwide accepted definition, classification, diagnosis and treatment modalities of this chronic disease. The possibility for interactive discussions should help in creating new milestones in glaucoma…

In the name of the ‘Glaucoma Board of the Austrian Ophthalmological Society’ we welcome you to our wonderful city and wish you some informative, pleasant days.

Andrea Mistlberger and Tony Hommer
THEME ONE

Ode to Joy

Joy, o wondrous spark divine,
Daughter of Elysium,
Drunk with fire now we enter,
Heavenly one, your holy shrine.
Your magic powers join again
What fashion strictly did divide;
Brotherhood unites all men
Where your gentle wings spread wide.

Embrace each other now, you millions!
The kiss is for the whole wide world!
Brothers - over the starry firmament
A beloved Father must surely dwell.

Freude, schöner Götterfunken,
Tochter aus Elysium,
Wir betreten feuertunken,
Himmlische, dein Heiligtum.
Deine Zauber binden wieder,
Was die Mode streng geteilt,
Alle Menschen werden Brüder,
Wo dein sanfter Flügel weilt.

Seid umschlungen, Millionen!
Diesen Kuß der ganzen Welt!
Brüder - überm Sternenzelt
Muß ein lieber Vater wohnen.

Text: Friedrich Schiller (1759-1805)
Music: Ludwig Von Beethoven (1770-1827)

THEME TWO

Glaucoma Hymn

Glaucoma, Glaucoma, Glaucoma
Constricting vision slowly
Halted by progress of science
Vision of a world united
Beyond all science knowing

“To know that what is impenetrable to us really exists, manifesting itself to us as the highest wisdom and the most radiant beauty, which our dull faculties can comprehend only in their most primitive forms – this knowledge, this feeling, is at the center of all true religiousness. In this sense, and in this sense only, I belong to the ranks of devoutly religious men.”

Albert Einstein

For I remained not knowing,
Beyond all science knowing.

St John of the Cross
TABBLAD ADVERTENTIE PFIZER
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<tr>
<th>Time</th>
<th>Agenda</th>
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<td>&quot;Meet the Expert&quot; Pfizer Morning Symposium</td>
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<td>8.30-10.00</td>
<td>Session 3: Diagnosis Based on Structure Update Structure and Function</td>
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<td>8.30-10.00</td>
<td>Session 6: Angle Closure Glaucoma CCT Risk Factors Screening</td>
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<td>9.00-10.00</td>
<td>Session 10: Medical Treatment</td>
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<td>9.00-10.00</td>
<td>Session 11: Alternative Treatment Laser Treatment</td>
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<td>9.30-10.15</td>
<td>Alcon Morning Symposium</td>
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<td>10.00-10.30</td>
<td>Break</td>
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<td>10.30-12.00</td>
<td>Inaugural Assembly Meeting of National and Regional Glaucoma Societies</td>
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<td>10.30-12.00</td>
<td>Session 4: Risk and Progression Quality of Life, Genetics, Pseudoexfoliation</td>
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<td>10.30-12.00</td>
<td>Session 7: Value Based Medicine RCT's Environmental Factors IOP Global Guidelines</td>
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<td>10.30-12.00</td>
<td>Session 8: From Science to Clinic</td>
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<td>10.30-12.00</td>
<td>Session 12: Glaucoma Surgery Consensus</td>
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<td>12.00-12.15</td>
<td>AIGS-Award</td>
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<td>12.00-2.00</td>
<td>Lunch break</td>
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<td>2.00-2.35</td>
<td>Opening Ceremony</td>
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<td>2.40-4.10</td>
<td>Session 1: Glaucoma Worldwide New Research</td>
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<td>3.00-4.30</td>
<td>Session 5: Glaucoma Societies Soc. impact of glaucoma Pathogen . progr. ACG</td>
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<td>3.30-4.30</td>
<td>14 Parallel Courses</td>
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<td>4.10-4.40</td>
<td>Break</td>
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<td>4.45-5.30</td>
<td>Session 2: New Ideas</td>
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<td>4.45-6.15</td>
<td>Poster Walkthrough + Technical Exhibition</td>
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<td>4.30-6.00</td>
<td>Poster Session</td>
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<td>4.30-5.30</td>
<td>Session 15: Closing Symposium Young Clinician Scientists: The Future of Glaucoma</td>
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<td>7.30-9.00</td>
<td>Imperial Viennese Glaucoma Ball</td>
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<td>7.00-9.00</td>
<td>Farewell Party Albertina</td>
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The number behind the time indication in the day-to-day program (e.g. D001 etc.) refers to the abstract numbers in the following categories:

- **O** = Opening Ceremony
- **D** = Didactic Sessions
- **GS** = Glaucoma Societies Sessions
- **C** = Courses

**Truman’s Law**

If you cannot convince them, confuse them

**Gunmidge’s Law**

The amount of expertise varies in inverse proportion to the number of statements understood by the general public
Prelude to the Scientific Program: Nodding-off episodes

Rockwood K, Hogan DB, Patterson CJ, for the Nodding and Presentations (NAP) Investigators, report in their article ‘Incidence of and risk factors for nodding off at scientific sessions’ (Can Med Assoc J 2005; 171: 1443-1445), on the conduct of a surreptitious, prospective, cohort study to explore how often physicians nod off during scientific meetings and to examine risk factors for nodding off. After counting the number of heads falling forward during two days of lectures, they calculated the incidence density curves for nodding off episodes per lecture (NOEL’s) and assessed risk factors using logistic regression analysis. They report their eye-opening results and suggest ways in which speakers can try to avoid losing their audience.

The outcome measure was the number NOEL’s per 100 participants. The authors counted 3-24 (median 18) NOEL’s per 100. Verily a respectable number. The risk factors are reproduced in the table.

Risk Factors for nodding off at lectures

<table>
<thead>
<tr>
<th>Factor</th>
<th>Odds ratio (and 95% CI*)</th>
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<tbody>
<tr>
<td>Environmental</td>
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<tr>
<td>Dim lighting</td>
<td>1.6 (0.8-2.5)</td>
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<tr>
<td>Warm room temperature</td>
<td>1.4 (0.9-1.6)</td>
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<tr>
<td>Comfortable seating</td>
<td>1.0 (0.7-1.30)</td>
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<tr>
<td>Audiovisual</td>
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<tr>
<td>Poor slides</td>
<td>1.8 (1.3-2.0)</td>
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<tr>
<td>Failure to speak in the microphone</td>
<td>1.7 (1.3-2.1)</td>
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<tr>
<td>Circadian</td>
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<tr>
<td>Early morning</td>
<td>1.3 (0.9-1.8)</td>
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<tr>
<td>Post prandial</td>
<td>1.7 (0.9-2.3)</td>
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<tr>
<td>Speaker-related</td>
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<tr>
<td>Monotonous tone</td>
<td>6.8 (5.4-8.0)</td>
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<tr>
<td>Tweed jacket</td>
<td>2.1 (1.7-3.0)</td>
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<tr>
<td>Losing place in lecture</td>
<td>2.0 (1.5-2.6)</td>
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*CI=Confidence Interval

This information has been included in the program for the benefit of both speakers and listeners.
WEDNESDAY JULY 6, 2005

Chair: A.G.P. Konstas

09.30 Role of fixed combinations in glaucoma therapy
A.G.P. Konstas

09.35 Novel fixed combination, a phase 3 overview
D. Bertin

09.50 European posology study for a novel fixed combination
P. Denis

10.05 Discussion

10.15 End

10.30 – 12.00 pm. Plenary Room. Inaugural Assembly Meeting of all National and Regional Glaucoma Societies.
Co-chairs: R.N. Weinreb, Rick Wilson, E.L. Greve

10.30 Opening
R.N. Weinreb

History and accomplishments
E.L. Greve

Goals of the AIGS
R.A. Hitchings

Glaucoma Society Organization, Directory
Rick Wilson

Introduction of Glaucoma Societies
Rick Wilson, Erik Greve

AIGS Guidelines for meetings
K. Singh, C. Migdal

Global Glaucoma Patient Organization

Discussion and Interactive Questions
AIGS Program

12.00 End

12.00 – 2.00 pm. LUNCH BREAK and SPECIAL MIDDAY SYMPOSIUM

12.30 – 1.30 pm. Plenary Room: Merck Special Midday Symposium: Therapeutic implications of IOP and OBF: one powerful solution.
Chair: L. Schmetterer

12.30 Welcome and introduction
L. Schmetterer

IOP in glaucoma: The value of 24 hr control
A.G.P. Konstas
WEDNESDAY JULY 6, 2005

Compromised bloodflow and glaucomatous damage: Evidence Based Medicine
J. Flammer

Pressure and perfusion: Clinical practicalities in optimal patient care
M.R. Lesk

Panel Discussion
L. Schmetterer

1.30 End

2.00 – 2.35 pm. Plenary Room. Opening Ceremony.
Co-chairs: R.N. Weinreb, R.A. Hitchings, Y. Kitazawa

2.00 Opening ‘Alle Menschen werden Brüder’*
R.N. Weinreb

2.03 O1 The World Glaucoma Congress
R. Von Habsburg

2.06 O2 International cooperation
O. Kitazawa

2.21 O3 Glaucoma cooperation in Asia
Y. Kitazawa

2.24 O4 Glaucoma cooperation in Latin America
R. Susanna

2.27 O5 The World Glaucoma Congress
E.L. Greve

2.31 Music: AIGS hymn

2.35 End

Co-chairs: M. Araie, R. Susanna, A. Heijl

Part A: Glaucoma Worldwide

2.40 D1 Non-governmental agencies and centers of excellence
G.N. Rao

2.50 D2 The glaucoma blindness prevention program of the WHO
S.P. Mariotti

2.58 D3 Glaucoma as a worldwide health problem
H.A. Quigley

3.06 D4 Research priorities in worldwide glaucoma
R. Thomas

3.14 D5 Public health issues in glaucoma
I. Goldberg

3.22 Conclusion

Part B: New Research

3.24 D6 How does the trabecular meshwork function?
E.R. Tamm

* Brotherhood unites all men
3.32 D7  Will we be able to see apoptotic RGC’s?
M.F. Cordeiro

3.40 D8  Is glaucoma a systemic disease curable by therapeutic neuroprotective vaccination?
M. Schwartz

3.48 D9  Glaucoma: more than the eye of the beholder
Y.H.Yücel

3.56 D10  What damages the optic nerve?
R.N. Weinreb

4.04  Conclusion

4.10 – 4.40 pm. BREAK


4.40 D11  Glaucoma examination
P.P. Lee

4.48 D12  Medical advice from glaucoma informatics study
P.A.Sample

4.56 D13  We should measure IOP continuously
P. Walter

5.04 D14  Is gene therapy coming?
P.L. Kaufman

5.12 D15  Relative merits of various treatment modalities
R.A. Hitchings

5.20 D16  Will trabeculectomy survive?
R.A. Lewis

5.28  Conclusion

Clark’s Law of Revolutionary Ideas

Every revolutionary idea – in Science, Politics, Art or Whatever – evokes three stages of reaction. They may be summed up by the three phrases:
1. “It is impossible – don’t waste my time”
2. “It is possible, but it is not worth doing”
3. “I said it was a good idea al along”
THURSDAY JULY 7, 2005

07.30 – 08.15. ‘MEET THE EXPERT’ BREAKFAST TABLES (see also page 45)


HRT baseline topographic optic disc measurements are associated with the development of POAG: results of the OHTS ancillary study
L.M. Zangwill

Progression analysis with the HRT and its relation to functional change
D.F. Garway-Heath

08.15 End

07.30 – 08.15. Room: Stolz 2. Pfizer Symposium: Success through persistency: long-term management of glaucoma

Persistency vs discontinuation: identifying who and why
H. A. Quigley

Practical considerations for maintaining therapy: role of the ophthalmologist
I. Goldberg

08.10 Panel discussion

08.15 End

08.30 – 10.00. Plenary Room. Session 3.

Part A: Diagnosis Based on Structure

08.30 D17 Documenting the optic nerve
D.S. Greenfield

08.38 D18 Photography: diagnosis based on structure
J.B. Jonas

08.43 D19 Confocal Scanning Laser Topography
D.F. Garway-Heath

08.48 D20 Confocal Scanning Laser Polarimetry
H.G. Lemij

08.53 D21 Optical Coherence Tomography
F. Medeiros

08.58 Panel Discussion, IAQ, Conclusion

Part B: Diagnosis Based on Function

09.10 D22 The interpretation of standard automated perimetry
P.A. Sample

09.18 D23 Selective tests of visual function
C.A. Johnson

09.26 D24 Abnormal visual function is required for diagnosis
A. Heijl

09.31 D25 Abnormal visual function is not required for diagnosis
G.A. Cioffi

09.36 Panel Discussion, IAQ, Conclusion
**Part C: Consensus Update S&F**

<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
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<tr>
<td>09.50</td>
<td>D26</td>
<td>Update on the Consensus on Structure and Function</td>
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<td>R.N. Weinreb, E.L. Greve</td>
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10.00 – 10.30. BREAK

**10.30 – 12.00. Plenary Room. Session 4.**

**Co-chairs: E.L. Greve, C. Baudouin, E.Z. Blumenthal**

**Part A: Risk and Progression**

<table>
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<tr>
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<td>IAQ</td>
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<td>10.34</td>
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<td>Risk assessment in glaucoma management</td>
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<td>D.S. Friedman</td>
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<td>10.42</td>
<td>D28</td>
<td>Function aspects of progression</td>
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<td>B. Chauhan</td>
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<td>10.50</td>
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<td>Structure aspects of progression</td>
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<td>C.A. Girkin</td>
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<td>10.58</td>
<td>D30</td>
<td>Function and structure aspects of progression</td>
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<td>L.M. Zangwill</td>
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<td>Panel Discussion, IAQ, Conclusion</td>
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**Part B: Quality of Life, Genetics, Pseudoexfoliation**

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<td>11.20</td>
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<td>Quality of life and glaucoma I</td>
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<td>R.K. Parrish</td>
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<td>11.26</td>
<td>D32</td>
<td>Quality of life and glaucoma II</td>
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<td>M. Araie</td>
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<td>11.32</td>
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<td>IAQ, Conclusion</td>
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<tr>
<td>11.36</td>
<td>D33</td>
<td>The molecular genetics of glaucoma</td>
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<td>W.L.M. Alward</td>
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<td>IAQ, Conclusion</td>
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<td>11.49</td>
<td>D34</td>
<td>Systemic factors in exfoliation syndrome</td>
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<td>R. Ritch</td>
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<td>11.57</td>
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<td>IAQ, Conclusion</td>
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12.00-12.15 pm. AIGS-AWARD 2004 CEREMONY
12.15 – 2.00 pm. LUNCH BREAK and SPECIAL MIDDAY SYMPOSIUM

12.15 – 1.15 pm. Plenary Room. Pfizer Special Midday Symposium: The constant revolution: turning concepts into practice for better clinical outcomes. Chair: R.N. Weinreb

12.15 The glaucoma continuum – into clinical practice
R.N. Weinreb

Viewing evidence in the round: the EGPS results and their clinical application
S. Miglior

The quality of IOP lowering: managing the circadian cycle
K. Singh

The widening circle: turning to adjunctive therapy
N. Pfeiffer

Summary – clinical pearls
R.N. Weinreb

1.15 End


2.15 GS1 Societal impact of glaucoma
A.L. Coleman (AGS)

2.27 Panel Discussion, IAQ

2.45 GS2 Pathogenesis and progression of primary angle closure glaucoma
R. Sihota (GSI)

2.57 Panel Discussion, IAQ

3.15 End

2.15 – 3.15 pm. PARALLEL COURSES

C001 An overview on new instruments and technology for imaging introductory)
L.M. Zangwill (chair), E.Z. Blumenthal, S. Miglior, D.S. Greenfield

C002 Advanced optic nerve imaging (HRT, GDX, OCT) – part 1

C003 Advances in psychophysical testing for glaucoma patients – part 1
P.A. Sample (chair), S.L. Graham, R. Harweth

C004 How to detect progression and use it to manage glaucoma – part 1
D.F. Garway-Heath (chair), B.C Chauhan, L.M. Zangwill, A. Heijl

3.30 – 4.30 pm. PARALLEL COURSES

C005 The art of written and oral presentations
D.S. Minckler (chair), R. Hitchings

C006 Design, conduct and interpretation of clinical trials: pearls and pitfalls
K. Singh (chair), A. Coleman, H.A. Quigley, R.P.L. Wormald
THURSDAY JULY 7, 2005

C007 Visual disability, quality of life, and outcomes
A.C. Viswanathan (chair), A. Azuara-Blanco, P.P. Lee, R.K. Parrish, G.L. Spaeth

C008 Risk factors for the development and progression of glaucoma
R. D. Fechtner (chair), D.S. Friedman, P. Mitchell, T. Yamamoto

C009 Proof of ganglion cell death prevention
L. Levin (chair), K.R.G. Martin, M. Schwartz

C010 Teleglaucoma
A. Tuulonen (chair), G. Michelson

C011 Genetic testing and counselling for the glaucoma patient
L. Alward (chair), J.E Craig, P.R. Healey

C012 Advanced optic nerve imaging (HRT, GDX, OCT) – part 2
H.G. Lemij (chair), R.D. Fechtner, F.A. Medeiros, M.M. Iester, C.F. Burgoynne,
R. Burk, M. Fingeret

C013 Advances in psychophysical testing for glaucoma patients – part 2
P.A. Sample (chair), J.G. Flanagan, R.S. Harwerth, C.A. Johnson

C014 How to detect progression and use it to manage glaucoma – part 2
D.F. Garway-Heath (chair), B.C Chauhan, L.M. Zangwill, A. Heijl

C015 Electrophysiology and glaucoma diagnosis
B.F. Fortune (chair), V. Parisi, S.L. Graham

C016 Assessment of blood flow in glaucoma
J. Flammer (chair), M. Araie, G.A. Cioffi, A. Harris, S.I. Orgül

C017 The role of optic disc photographs in glaucoma management
B. Jonas (chair), P.J. Airaksinen, J. Caprioli, P. Mitchell

C018 Visual fields in advanced glaucoma
D. L. Budenz (chair), R.L. Stamper, M. Fingeret

4.45 – 6.15 pm. POSTER WALKTHROUGH + TECHNICAL EXHIBITION

Parkinson’s axioms
1. An official wants to multiply subordinates, not rivals
2. Officials make work for each other
FRIDAY JULY 8, 2005

07.30 – 08.15. ‘MEET THE EXPERT’ BREAKFAST TABLES (see page 45)

07.30 – 08.15. Room; Schubert 2. CZM Symposium: Case examples illustrating how experts integrate available clinical information. Chair: A. Heijl

07.30  Beyond structure/function: glaucoma diagnosis and management for the rest of us
J.B. Jonas, S. Miglior
08.15  End


07.30  Precision IOP and the cornea: clinical relevance for glaucoma
I.K. Ahmed
The effect of corneal biomechanics on tonometry
D.F. Garway-Heath
What the ocular pulse amplitude can tell us about glaucoma
A. Harris
Clinical validation of the Dynamic Contour Tonometer: studies on eye bank eyes and on LASIK patients
C. Kniestedt
Visual field defects and Dynamic Contour Tonometry
C. Roberts
08.15  End

07.30 – 08.15. Room: Stolz 1. Pfizer Symposium: Integrating risk assessment into clinical practice

07.30  Rationale for risk assessment: application in ocular hypertension
R.N. Weinreb
07.50  How to apply that risk to decision-making
F. Medeiros
08.10  Panel discussion
08.15  End

Co-chairs: S. Obstbaum, J. Zhao, P.J. Foster

Part A: Angle Closure Glaucoma

08.30  D35  Diagnosis: gonioscopy
D.S. Friedman
08.35  D36  Diagnosis: UBM
P. RojanaPongpun
08.40  D37  Diagnosis: OCT
T. Aung
FRIDAY JULY 8, 2005

08.45 D38 Differential diagnosis
P.J. Foster

08.50 D39 Result of peripheral iridotomy
R. Thomas

08.55 D40 What to do after peripheral iridotomy?
P. Chew

09.00 D41 Treatment options
D.S. Friedman

09.05 D42 A role for cataract extraction?
D. Lam

09.10 Panel Discussion, IAQ, Conclusion

Part B: CCT, risk factors, screening

09.24 IAQ

09.26 D43 CCT should be measured in all patients
J.D. Brandt

09.31 D44 CCT should not be measured in all patients
M. Diestelhorst

09.36 IAQ

09.38 D45 Disk hemorrhages are the most important risk factor
K. Ishida

09.43 D46 Disk hemorrhages are not the most important risk factor
P.J. Airaksinen

09.48 IAQ

09.50 D47 Screening for POAG is feasible
A. Heijl

09.55 D48 Screening for POAG is not feasible
R.P.L. Wormald

09.59 IAQ and Conclusion

10.00 – 10.30. BREAK

PARALLEL SESSION

Co-chairs: R. Thomas, A. Tuulonen, T. Aung

Part A: Evidence Based and Value Based Medicine

10.30 D49 Evidence Based and Value Based Medicine
Roy Wilson

Part B: RCT’s

10.38 D50 New information from OHTS
R.K. Parrish
<table>
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<th>Session</th>
<th>Title</th>
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<tr>
<td>10.43</td>
<td>D51</td>
<td>What do we learn from OHTS for our practice</td>
<td>P.R. Healey</td>
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<tr>
<td>10.48</td>
<td>D52</td>
<td>New information from EGPS</td>
<td>S. Miglior</td>
</tr>
<tr>
<td>10.53</td>
<td>D53</td>
<td>What do we learn from EGPS for our practice</td>
<td>K. Singh</td>
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<tr>
<td>10.58</td>
<td>D54</td>
<td>New information from EMGT</td>
<td>A. Heijl</td>
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<tr>
<td>11.03</td>
<td>D55</td>
<td>What do we learn from EMGT for our practice</td>
<td>D. Grigera</td>
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<td>11.08</td>
<td>D56</td>
<td>New information from AGIS</td>
<td>P. Palmberg</td>
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<tr>
<td>11.13</td>
<td>D57</td>
<td>What do we learn from AGIS for our practice</td>
<td>D.S. Minckler</td>
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<td>11.18</td>
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<td>Panel Discussion, IAQ, Conclusion</td>
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**Part C: Environmental risk factors; role of pressure in glaucoma, Global Guidelines on Diagnosis and Treatment**

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<tr>
<td>11.27</td>
<td>D58</td>
<td>Systemic and environmental factors in open angle glaucoma</td>
<td>P. Mitchell</td>
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<tr>
<td>11.35</td>
<td>D59</td>
<td>All glaucoma’s have a pressure component</td>
<td>C.F. Burgoyne</td>
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<tr>
<td>11.40</td>
<td>D60</td>
<td>Not all glaucoma’s have a pressure component</td>
<td>J. Flammer</td>
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<td>11.45</td>
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<td>IAQ</td>
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<td>11.50</td>
<td>D61</td>
<td>Global Guidelines on Diagnosis and Treatment</td>
<td>J.M. Liebmann, C. Traverso</td>
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**PARALLEL SESSION**

Co-chairs: L.A. Levin, P.T. Khaw, E. Lütjen-Drecoll

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<td>Introduction</td>
<td>L.A. Levin</td>
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<td>D62</td>
<td>Relationship between anterior and posterior segment morphology and pathophysiology</td>
<td>E. Lütjen-Drecoll</td>
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<td>10.46</td>
<td>D63</td>
<td>The mouse model in glaucoma research</td>
<td>J. Crowston</td>
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<td>D64</td>
<td>Predictive DNA testing for glaucoma</td>
<td>J.E. Craig</td>
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<td>11.10</td>
<td>D65</td>
<td>Auto-antibody profiles in glaucoma</td>
<td>F.H. Grus</td>
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FRIDAY JULY 8, 2005

11.21 D66 Oxidative damage in glaucoma
G. Tezel

11.29 Comment

11.32 D67 Apoptosis signalling in neurons
L.A. Levin

11.40 Comment

11.43 D68 Gene delivery in experimental glaucoma
K.G.R. Martin

11.51 Comment

11.54 Summary
P.T. Khaw

12.00 End

12.00 – 2.00 pm. LUNCH BREAK and SPECIAL MIDDAY SYMPOSIUM

12.05 – 1.05 pm. Room: Plenary Room. Alcon Special Midday Symposium.
Co-chairs: R.N. Weinreb, Y. Kitazawa

12.05 Opening comments
R.N. Weinreb, Y. Kitazawa

Advancements in the diagnosis of glaucoma
F. Medeiros

24 hr IOP control in glaucoma
A.G.P. Konstas

Improving glaucoma outcomes: past, present and future
R.L. Gross

Improving outcomes: patient management advancements
D.S. Friedman

Surgical advancements
F. Grehn

Q&A
Co-chairs

Closing comments
1.05 End

2.00 – 3.00 pm. Plenary Room. Session 9. Glaucoma Society Session.
Co-chairs: G.L. Skuta, R. Thomas

2.00 GS3 Wound healing
P.T. Khaw (EGS)

2.12 Panel Discussion

2.30 GS4 Anterior segment changes after filtering surgery
N.-L. Wang (ChinGS)

2.32 Panel discussion

3.00 End
# FRIDAY JULY 8, 2005

## 2.00 – 3.00 pm. **PARALLEL COURSES**

<table>
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<tr>
<td>C019</td>
<td>Gonioscopy versus UBM and OCT for chamber angle evaluation – part 1</td>
<td>C.E. Traverso (chair), G. Marchini, P.J. Foster, W.L.M. Alward, J. Liebmann</td>
<td>Lehar 1</td>
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<tr>
<td>C020</td>
<td>New tonometry/CCT/continuous IOP measurement – part 1</td>
<td>J.D. Brandt (chair), M. Diestelhorst, Y. Kuwayama, Y. Lachkar, L.E. Pillunat, P. Shah</td>
<td>Stolz1</td>
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## 3.15 – 4.15 pm. **PARALLEL COURSES**

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<tr>
<td>C023</td>
<td>Guidelines for the diagnosis and treatment of POAG: individualizing glaucoma management</td>
<td>A. Tuulonen (chair), A. Heijl, E.L. Greve</td>
<td>Plenary Room</td>
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<tr>
<td>C024</td>
<td>Experimental models of glaucoma</td>
<td>J.D. Lindsey (chair), J.A. Cioffi, R.S. Harwerth</td>
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<tr>
<td>C025</td>
<td>Normal pressure glaucoma</td>
<td>R. Hitchings (chair), M. Aihara, Y. Kitazawa, T. Krupin</td>
<td>Lehar 4</td>
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<tr>
<td>C026</td>
<td>Congenital and infantile glaucoma</td>
<td>P.T. Khaw (chair), M.S. Jafaar</td>
<td>Schubert 1</td>
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<td>C028</td>
<td>Glaucoma and uveitis</td>
<td>K. Barton (chair), S. Gandolfi</td>
<td>Schubert 3</td>
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<tr>
<td>C029</td>
<td>Gonioscopy versus UBM and OCT for chamber angle evaluation – part 2</td>
<td>C.E. Traverso (chair), G. Marchini, P.J. Foster, W.L.M. Alward, J. Liebmann</td>
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<td>C030</td>
<td>New tonometry/CCT/continuous IOP measurement – part 2</td>
<td>J.D. Brandt, M. Diestelhorst, Y. Kuwayama, Y. Lachkar, L.E.Pillunat, P. Shah</td>
<td>Stolz 1</td>
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<td>C033</td>
<td>Glaucoma in systemic diseases</td>
<td>J. Flammer (chair), D. Gherghel, K. Kashiwagi, M. Pache</td>
<td>Schubert 4</td>
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<td>C034</td>
<td>Practical digital slit lamp photography - a practical guide to optic disc, angle and bleb photography</td>
<td>A.P. Wells (chair), F.H. Grus, W. Birchall, B.C. Little</td>
<td>Schubert 5</td>
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<tr>
<td>C035</td>
<td>Medical therapy principles</td>
<td>A. Alm (chair), A. Azuara-Blanco, R.D. Fechtner, P. Kaufman, J. Thygesen</td>
<td>Schubert 6</td>
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<tr>
<td>C036</td>
<td>Neuroprotection and apoptosis of retinal ganglion cells related to glaucoma</td>
<td>L. Levin (chair), M.F. Cordeiro, N.N.Osborne, G. Tezel</td>
<td>VIP</td>
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## 4.30 – 6.00. **POSTER SESSION**

**PLENARY ROOM**
SATURDAY JULY 9, 2005

PARALLEL SESSION


09.00 D69  Mechanisms of action of glaucoma medication  
P.L. Kaufman
09.08  Comment  
A. Alm
09.10 D70  Prostaglandins are first choice  
G.L. Skuta
09.15 D71  Prostaglandins are not first choice  
Y. Kuwayama
09.20  Panel Discussion, IAQ, Conclusion
09.27 D72  Is there a place for combination drops?  
R.D. Fechtner
09.32  Comment  
G. Holló
09.35 D73  Maximum medical therapy  
S. Gandolfi
09.40  Comment  
J.M. Liebmann
09.43  Panel discussion, IAQ, Conclusion
09.50 D74  Target IOP is useful  
C. Migdal
09.55 D75  Target IOP is not useful  
J. Caprioli
10.00  End

PARALLEL SESSION


Part A: Alternative treatment modalities

09.00 D76  What is the evidence to support glaucoma neuroprotection?  
L.A. Wheeler
09.08 D77  Yes, there are other ways to treat glaucoma  
L.A. Levin
09.13 D78  There are no other ways to treat glaucoma  
H. Tanihara
09.18  IAQ

Part B: Laser Treatment

09.25 D79  ALT and SLT are the same  
L.J. Katz
09.30 D80  ALT and SLT are different  
A.D. Realini
SATURDAY JULY 9, 2005

09.35  Panel Discussion, IAQ
09.42  D81  LTP should be initial treatment of OHT or glaucoma
         G.L. Spaeth
09.47  D82  LTP should not be initial treatment of OHT or glaucoma
         C.B. Camras
09.52  Discussion, IAQ, Conclusion
10.00  End

10.00 – 10.30. BREAK

PARALLEL SESSION

Co-chairs: R.N. Weinreb, F. Grehn, P.T. Khaw

10.30  D83  Introduction
         R.N. Weinreb
10.33  D84  Indications for surgery
         R.D. Fechtner
10.36  D85  Laser trabeculoplasty
         D.S. Minckler
10.39  D86  Wound healing
         J. Crowston
10.42  D87  The future of wound modulation
         P.T. Khaw
10.47  Discussion / IAQ
10.57  D88  Trabeculectomy
         J.M. Liebmann
11.00  D89  How does non penetrating filtering surgery work
         T. Shaarawy
11.05  D90  Non Penetrating Glaucoma Drainage Surgery (NPGDS)
         R.G. Carassa
11.08  D91  Comparison of trabeculectomy versus NPGDS
         I. Goldberg
11.11  Discussion / IAQ
11.21  D92  Combined cataract and glaucoma surgery
         G.A. Cioffi
11.24  Discussion / IAQ
11.29  D93  Glaucoma Drainage Devices (GDD)
         A.L. Coleman
11.32  D94  Comparison MMC trabeculectomy vs GDD
         F. Grehn
11.35  Discussion / IAQ
11.45  D95  Cyclodestruction
         D. Lam
11.48  D96  Comparison GGDs versus cyclodestructive procedures
         K. Singh
SATURDAY JULY 9, 2005

11.51  Discussion / IAQ
11.56  Consensus conclusions and consequences for clinical practice
       R.N. Weinreb
12.00  End

PARALLEL SESSION


Part A: Glaucoma Surgery Videos: Incisional Surgery

10.30  D97  Viscocanalostomy
       R.G. Carassa
10.35  Comment
10.38  D98  Deep sclerectomy
       A. Mermoud
10.43  Comment
10.46  D99  Fornix based trabeculectomy
       P. Palmberg
10.51  Comment
10.54  D100 Limbus based trabeculectomy
       Rick Wilson
10.59  Comment
11.02  D101 Management of small pupils
       N. Pfeiffer
11.07  Comment
11.10  D102 Zonular laxity, dehiscence
       I.K. Ahmed
11.15  Comment
11.18  D103 Capsular tension rings
       A.S. Crandall
11.23  Comment
11.26  D104 Combined cataract and glaucoma surgery
       P. Palmberg
11.31  Comment
11.34  D105 Glaucoma drainage device and cataract surgery
       D.L. Budenz
11.39  Comment
11.42  End

12.00 – 2.00 pm. LUNCH BREAK and SPECIAL MIDDAY SYMPOSIUM

12.15 – 1.15 pm. Room: Plenary Room. Allergan Special Midday Symposium:
Optic Nerve in Focus. Co-chairs: R.A. Hitchings, R.N. Weinreb

12.15  Individual treatment & future for glaucoma management
       Chairmen
SATURDAY JULY 9, 2005

Glaucoma progression
A. Heijl

Joint session: See me – Save me. Early detection of glaucoma (IAQ)
R. Susanna, I. Goldberg, R.N. Weinreb

Management of the patient at risk
L. Rossetti

Beyond IOP benefits of neuroprotection
L.A. Levin

Discussion
1.15 End


2.00 GS5 Normal tension glaucoma
T. Yamamoto (JGS)

2.12 Panel Discussion, IAQ

2.30 GS6 Perimetry after surgery in late stages of glaucoma
J.F. Casiraghi (LAGS)

2.32 Panel Discussion, IAQ

2.59 End

2.00 – 3.00 pm. PARALLEL COURSES

C037 Optimizing trabeculectomy outcome: intraoperative techniques – part 1
F. Grehn (chair), K. Barton, P.T. Khaw, J. Liebmann, P. Shah Stolz 1

C038 Filtering surgery: penetrating/non-penetrating/implants – part 1

C039 Managing cataract and glaucoma – part 1

C040 Laser surgery of the iris and the angle: IPI-ALT iridoplasty
Y. Lachkar (chair), J. Katz, T. Realini, J. Thygesen Lehar 2

3.15 – 4.15 pm. PARALLEL COURSES

C042 The use of releasable sutures in glaucoma surgery
R.P. Wilson (chair), J.S. Cohen Lehar 3

C043 Fibrosis inhibition with filtration surgery
P.T. Khaw (chair), C. Baudouin, J. Crowston, B.E.Prum Lehar 4

C044 Safe and effective glaucoma drainage device implantation
D. Minckler (chair), D.L. Budenz, R. Susanna, D.K. Heuer Schubert 1

C045 Pediatric glaucoma surgery
N. Pfeiffer (chair), F. Grehn, M.S. Jaafar, K.F. Tomey Schubert 2

C046 Cyclophotocoagulation – why, when and how?
P. Bloom (chair), D.K. Heuer, R. Susanna Schubert 3
SATURDAY JULY 9, 2005

C047  Optimizing trabeculectomy outcome: postoperative management – part 2
  F. Grehn (chair), K. Barton, P.T. Khaw, J. Liebmann, P. Shah  Stolz 1

C048  Filtering surgery: penetrating/non-penetrating/implants – part 2

C049  Managing cataract and glaucoma – part 2

C050  Size matters: intraocular surgery in highly miopic or nanophthalmic eyes
  D.E. Grigera (chair), R Gross, H. Tanihara  Schubert 4

C051  Surgical treatment of glaucoma
  J. Ge (Chair), N. Wang, J. Zhao, X. Zhang, M. He, X. Sun  Schubert 5


4.30  Introduction
  R.N. Weinreb

4.31  D106  Molecular genetics of primary congenital glaucoma: The Indian scenario
  S. Chakrabarthi

4.39  D107  New directions for glaucoma genetic research
  A.C. Viswanathan

4.47  D108  Perspectives in glaucoma: from cell biology to epidemiology
  P.R. Healey

4.55  D109  Will my patient develop glaucoma? Risk assessment in ocular hypertension
  F. Medeiros

5.03  D110  New frontiers in angle closure glaucoma research
  T. Aung

5.11  D111  New possible medical therapy for glaucoma
  M. Honjo

5.19  D112  The future of glaucoma research
  R.N. Weinreb

5.23  D113  The future of glaucoma
  R.A. Hitchings

5.30  End

Peter’s Placebo

An ounce of image is worth a pound of performance
CURRICULUM VITAE

Special Guest and Opening Speaker:

Dr. Otto von Habsburg

Archduke Otto was born in Reichenau (Lower Austria) on 20th November 1912 as the oldest son of Archduke Carl of Austria (later Emperor Karl I. of Austria, King of Hungary, Bohemia, Croatia etc.) and of Princess Zita de Bourbon-Parma (later Empress and Queen). He was baptized Franz Joseph Otto Robert Maria Anton Karl Max Heinrich Sixtus Xavier Felix René Ludwig Gaetano Pius Ignazius by the Cardinal Of Vienna. From 1916 on he was the Crown Prince of Austria-Hungary.

Until the end of the first world war, 1918, he lived in Austria-Hungary. After that, because of the special anti-Habsburg laws, in exile in Switzerland, on Madeira, at Lequeitio (Spain), at Steenockerzeel (Belgium), in Paris, and from 1940 to 1944 in Washington D.C. (USA). 1944 he returned to Europe, lived in France and since 1954 in Pöcking (Bavaria). A return to Austria became only possible, after a law-dispute of many years, in 1966 by a judgement of the Administration Court of Justice.

Studies: Otto von Habsburg finished his high school studies in Spain on the basis of the Austrian and the Hungarian school programme. Studies of political and social sciences at the University in Louvain (Belgium), finishing it with a doctorate in 1935.

Scientific and publishing activities: Otto von Habsburg published 35 books in nine languages on historical, social and political topics and particularly on European politics. Also numerous contributions to books, periodicals and newspapers. Since 1953 a weekly chronicle regarding present events appears from him in many daily papers in several languages.

Political activities: In the 1930-ies Otto von Habsburg openly objected the National-Socialism and opposed March 1938 the annexation (‘Anschluss’) of Austria by the German Reich. The Nazis pursued him with a warrant for his arrest. At the outbreak of the war he helped more than ten thousand NS-persecuted people, mainly Jews, to escape to overseas. During the second world war he worked in the USA for the restoration of Austria, the self-determination of Southern Tirol and against the expulsion of the Germans from the Sudeten area and from the German Eastern regions. After the war he was again expelled from Austria at the pressure of the Soviet Occupation Forces.

Since 1936 Otto von Habsburg is a member of the Richard Coudenhove-Kalergi founded Paneuropean-Union, and since 1957 its International Vice-President. After the death of the founder he took over in 1973 as International President the direction of the Paneuropean-Union. He developed the organization into a mass-movement for a free, Christian, social and united Europe and made it into the advocate for the people of Central- and Eastern-Europe suppressed by communist regimes.

Otto von Habsburg became a Member of the European Parliament at the first direct election on 10th June 1979. There he was until July 1999 Chairman of the Christian-Democratic EVP-Faction in the External Affairs Commission, President i.e. Vice-President of the Hungarian Delegation and also active as the Parliament’s Age-Doyen. The putting up of an empty seat for the oppressed people of Europe, the re-discovery of the term Central-Europe, the development of common external and security politics and the opening possibility for the countries of Central- and Eastern-Europe to join the European Union, carry his handwriting. He was the commentator for Spain’s entry into the EG of the time, for the negotiation and cooperation agreement with Marokko and for the EU-accession of Hungary.

Since 1989 he worked on the extension of the Paneuropean Union into the countries behind the ‘Iron Curtain’, on the independence of the Baltic States from Moscow, and of Croatia, Slovenia, Bosnia-Herzgovina and Macedonia from Belgrade. On 19th August 1989 he was the Patron of the ‘Paneuropean-Picnic’ in Sopron, at which 661 Germans from the ‘DDR’ dared to make the first great escape of the masses.

Memberships and academic honours: Academie des Sciences Morales et Politiques, Institut de France in Paris; Real Academia de Ciencias Morales y Politicas in Madrid; Academia da Cultura Portuguesa in Lisbon; Academia Mejicana de Derecho Internacional in Mexico; Academie du Royaume du Maroc; Professor h.c. of the University of Bogota (Columbia); Honorary Member of the Instituto de Estudios da Marinha (Portugal); Honorary Fellowship of the University of Jerusalem; Dr. h.c. of the Universities of Nancy, Tampa, Cincinnati, Ferrara, Pécs/Fünfkirchen, Budapest, Turku, Osijek and Skopje.

Ordres and Decorations; Grand Cross of the Papal Order of Gregory the Great with Cordon and Star; Bavarian Order of Merit (Bayerischer Verdienstorden), Grand Cross of the Luxemburg Orde of the Golden Lion; Grand Cross of the Order Carlos III of Spain; Orden de Africa; Federal Distinguished Service Cross (Bundesverdienstkreuz) of the Federal Republic of Germany; Order of King Zvonimir of Croatia; ‘Marjaa Maa Orden’ of Estonia; Grand Cross of the Order of Merit of the Republic of Hungary; European Karls-Preis of the Sudeten-German Landsmannschaft; Médaille de Mérite Européen of Luxemburg; Gold Medal Robert-Schuman; European Award Coudenhove-Kalergi, Commandant de la Légion d’Honneur etc.
CURRICULUM VITAE

Special Guest

Gullapallin N. Rao, M.D., Diplomate of American Board, FACS, FRCS, FNAMS, D.Sc.

Title and Affiliation: Chairman, Board of Trustees and President, International Agency for the Prevention of Blindness, Distinguished Chair of Eye Health, L V Prasad Eye Institute, Hyderabad, India; Adjunct Professor, University of New South Wales, Australia (1993-), Clinical Professor of Ophthalmology, University of South Carolina, Columbia, USA (1997-), Adjunct Professor of Ophthalmology, University of Rochester, USA (2002-), formerly Associate Professor of Ophthalmology, and Director, Cornea Research Laboratory, University of Rochester, Rochester, New York and Medical Director, Rochester Eye Bank.

Leadership Positions: Chairman-Board of Trustees and President International Agency for the Prevention of Blindness (2004-).

Research Interests: Diseases of cornea and community eye health.

Leadership Positions: Chairman-Board of Trustees and President International Agency for the Prevention of Blindness (2004-).

Special Honors: Padma Shri from the Government of India – 2002 (Republic Day Honours given by the President of India), Rustom Merwanji Alpawalla Memorial Award by National Association for the Blind (2003), Vocational Excellence Award by Rotary International (2003), First ‘Global Visionary in Ophthalmology’ Award presented by Bausch & Lomb (2003), Fellow qua Surgeon ad eundem of the Royal College of Physicians and Surgeons of Glasgow (2003); HRH Prince Abdulaziz bin Ahmed bin Abdulaziz Al-Saud Award for the Prevention of Blindness Award.
CURRICULA VITAE

NB. Many of these short CV sketches are no more than the tip of an iceberg of many pages with affiliations, honors, rewards, published literature etc.. It would be impossible to publish all CV material we received. The CV sketch may have missed important information.

Ike K. Ahmed, MD, FRCS(C), DABO
Ike K. Ahmed, MD is a fellowship-trained glaucoma, cataract, and anterior segment surgeon practicing in Toronto, Ontario. Surgical management of glaucoma, the complex cataract and management of cataract complications are his areas of subspecialty expertise.
Dr. Ahmed has a keen interest in the development of advanced microsurgical techniques in glaucoma surgery and complicated cataract extraction, and is actively involved in research and medical education at a national and international level. He has received research grants to study glaucoma medications, glaucoma laser and surgical techniques, optic nerve imaging in glaucoma, cataract surgical techniques and devices, and intraocular lens designs. Dr. Ahmed has designed innovative glaucoma diamond scalpels for surgery, microsurgical instrumentation, and devices, implants, and techniques for the management of the dislocated cataract.
Dr. Ahmed is the Director of the upcoming third International Congress on Glaucoma Surgery in May 2006 in Toronto. He is currently an Assistant Professor at the University of Toronto, and a Clinical Assistant Professor at the University of Utah.

Makoto Araie, M.D., Ph.D.
Title and Affiliation: Assistant Professor, Department of Ophthalmology, Faculty of Medicine, University of Tokyo, Japan.
Research Interest: Glaucoma, Normal-tension glaucoma, Ocular blood flow, Ocular pharmacokinetics, Neuroprotection.

P. Juhani Arakinen, MD, PhD
Title and Affiliation: Professor and Head, Department of Ophthalmology and the Oulu University Eye Hospital, Oulu, Finland.
Research Interest: Medical and Surgical Glaucoma.

Albert Alm, M.D., Ph.D.
Title and Affiliation: Professor, Department of Ophthalmology, Uppsala University, Uppsala, Sweden.
Research interest: Glaucoma, Ocular blood flow.
Awards: Alcon Research Institute’s Award for 1994.

Wallace L.M. Alward, M.D.
Title and Affiliation: Professor of Ophthalmology, Director, Glaucoma Service, University of Iowa College of Medicine.
Research interests: The molecular genetics of glaucoma; Pigmentary glaucoma; Normal tension glaucoma; Axenfeld-Rieger syndrome; Gonioscopy.
Leadership positions: Vice Chairman of Ophthalmology, University of Iowa; Director, Research Committee, American Glaucoma Society; Editorial Board, American Journal of Ophthalmology; Editorial Board, Journal of Glaucoma; Editorial Board, International Glaucoma Review.

Tin Aung, FRCSEd, FRCOphth, PhD (Lond)
Affiliations: Consultant Ophthalmologist, Glaucoma Service, Singapore National Eye Centre, Consultant Ophthalmologist, National University Hospital, Singapore, Assistant Professor, Department of Ophthalmology, National University of Singapore, Associate Director, Singapore Eye Research Institute
Research interests: Main research interests: angle closure glaucoma and the molecular genetics of eye diseases.

Augusto Azuara-Blanco, Ph.D., FRCS (Ed)
Affiliations: Consultant Ophthalmologist, Aberdeen Royal Infirmary (NHS Grampian) and University of Aberdeen, UK
Research interests: Diagnosis of glaucoma, evidence-based medicine, quality of life, health economics, ocular surface.
Leadership positions: Consultant Ophthalmic Surgeon, Aberdeen Royal Infirmary; Honorary Senior Lecturer, University of Aberdeen; Member of the editorial board of
Keith Barton MD FRCP FRCS FRCOphth
Affiliation: Consultant Ophthalmologist, Glaucoma Service Director, Moorfields Eye Hospital, 162 City Road London EC1V 2PD, United Kingdom
Research interest: Secondary glaucomas especially uveitic glaucoma, Glaucoma surgery, especially Aqueous Shunt Devices.
Leadership positions: Clinical Director of the Glaucoma Service, Moorfields Eye Hospital, Trustee of the International Glaucoma Association.

Christophe Baudouin, MD, PhD (France)
Title ands Affiliations: Professor of Ophthalmology, the head of the department of Ophthalmology, Ambroise Paré Hospital, APHP, University of Versailles, and the head of the Department III of Quinze-Vingts National Ophthalmology Hospital, Paris.
Research Interest: Dry eye, ocular allergy, toxic side-effects induced by topical treatments, especially in glaucoma.
Leadership positions: Editor-in-chief of the French Journal of Ophthalmology, President of the Ophthalmological Society of Paris and member of eight international societies.

Wayne Birchall, FRCOpht
Title: Glaucoma Fellow
Affiliation: Ophthalmology Dept, Wellington Hospital, Wellington, New Zealand
Research interests: Surgical techniques in trabeculectomy, Ultrasound biomicroscopy

Philip Bloom, FRCS FRCOphth
Affiliations: Consultant Ophthalmic Surgeon, Western Eye & Hillingdon Hospitals, Honorary Senior Lecturer, Imperial College School of Medicine
Research Interests: Cyclophotocoagulation, Spectacle independence following cataract surgery
Leadership positions / special honours: Lead Clinician and Service Director, Western Eye Hospital

Head of Glaucoma services, Hillingdon Hospital, Vice President, Ophthalmology section, Royal Society of Medicine, Course Leader, Post-Graduate Diploma in Ophthalmology (Middlesex University).

Eytan Z. Blumenthal, MD
Title and Affiliations: Lecturer, Department of Ophthalmology, The Hebrew University-Hadassah Medical School, Jerusalem; Director of teaching activities, Department of Ophthalmology, The Hebrew University-Hadassah Medical School, Jerusalem; Head Glaucoma Service, Hadassah University Hospital, Jerusalem, Israel.

James D. Brandt, M.D.
Title: Professor & Director, Glaucoma Service
Affiliation: Department of Ophthalmology & Vision Science, University of California, Davis
Research Interest: Pachymetry & tonometry techniques and their impact on clinical trials; Trabecular Meshwork physiology; New drug development (basic and clinical); Infantile and Pediatric glaucoma.
Leadership Positions: Editorial Board, Ophthalmology; Program Chair, American Glaucoma Society; Board of Directors, Glaucoma Research Foundation.
Special Honors: Senior Achievement Award, American Academy of Ophthalmology (2004); Secretariat Award, American Academy of Ophthalmology (2004)

Donald L. Budenz, MD, MPH
Title: Associate Professor
Affiliation: Department of Ophthalmology, Epidemiology, and Public Health, University of Miami School of Medicine, Bascom Palmer Eye Institute.
Research interests: Diagnosis of glaucoma and glaucoma progression; management of glaucoma
Leadership positions: Associate Medical Director, Anne Bates Leach Eye Hospital

Claude F. Burgoyne, M.D.
Title and Affiliation: Professor of Ophthalmology and Neuroscience, Director, Glaucoma Service, Louisiana State University Health Sciences Center, School of Medicine, New Orleans, Louisiana, U.S.A.

Reinhard Burk, M.D., Ph.D.
Title: Professor Dr. med. Dr. med. habil.
Affiliation: Department of Ophthalmology, Städtische Kliniken Bielefeld, An der Rosenhöhe 27, D- 33647 Bielefeld, Germany.
Teaching position: Department of Ophthalmology, University of Heidelberg, Department of Ophthalmology, Städtische Kliniken Bielefeld. Research interest: Development of three-dimensional optic nerve head structure analysis by Laser Scanning Tomography (HRT); Surgical modifications of deep sclerectomy and viscosocanulostomy by irrigation trabeculotomy and ab externo laser trabeculotomy (US patent).

Leadership positions: 1992-2001 Vice Director, Department of Ophthalmology, University of Heidelberg; since 2001 Director and Head, Department of Ophthalmology, Kliniken Bielefeld
Awards: "Glaukompreis" of the Deutsche Ophthalmologische Gesellschaft DOG
Member of the Glaucoma Society of the International Congress of Ophthalmology GSICO

Carl B. Camras, MD, FACS
Title and Affiliation: Professor and Chairman, Director of the Glaucoma Service, Department of Ophthalmology, University of Nebraska Medical Center, Omaha, Nebraska, U.S.A.
Research Interest: Gaucoma, with special emphasis on glaucoma pharmacology and aqueous humor dynamics.

Joseph Caprioli, M.D.
Title and Affiliation: Professor of Ophthalmology, UCLA School of Medicine
Special honors: Research to Prevent Blindness Physician Scientist Award (2002); Secretariat Award, American Academy of Ophthalmology (2004); Certificate of Appreciation, American Academy of Ophthalmology, for outstanding contributions to Quality of Care (2005).

Roberto G. Carassa M.D.
Research Interests: Early glaucoma Diagnosis by Image analysis of the optic disc; New lasers applications in glaucoma; New drugs for medical glaucoma treatment; New non-penetrating surgery for glaucoma.
Leadership positions: Editor-in-chief of the Journal Rivista Trimestrale di Oftalmologia;Member of the Scientific Editorial Board of the European Journal of Ophthalmology; Member of the International Editorial Board of the Journal Ocular Surgery News: Europe/Asia Pacific Edition.

Javier F. Casiraghi, M.D.
Affiliation: Department of Ophthalmology, University of Buenos Aires, Argentine
Research interest: New surgicals procedures, devices, perimetry; farmacology
Leadership positions: Chief, Glaucoma Service; Hospital de Clínicas – School of Medicine, University of Buenos Aires; Coordinator of The post-graduate course in glaucoma of The Favaloro University.
Special honors: President of The Argentine Glaucoma Society; Courses Director of The Argentine Council of Ophthalmology; Executive secretary of The Panamerican Glaucoma Society; Delegate of The Latin American Glaucoma Society.

Subhabrata Chakrabarti, Ph.D.
Affiliation: Brien Holden Eye Research Centre, L.V. Prasad Eye Institute, Hyderabad, 500034, India.
Research interest: Understanding the molecular genetics of complex eye diseases like glaucoma, myopia and AMD; Gene mapping and association studies based on DNA markers; Devising molecular diagnostics in inherited eye diseases; Evolutionary biology and migration of disease genes in populations.
Leadership positions: Staff scientist in molecular genetics at the LV Prasad Eye Institute; Group leader in glaucoma genetics study; Coordinator of the international myopia genetics study; Principal investigator in joint US-Indo projects on glaucoma research; Principal investigator in molecular diagnostics of eye and vision projects.

Balwantray Chauhan
Title and Affiliation: Professor, Research Director and Chair in Vision Research, Department of Ophthalmology and Visual Sciences, Dalhousie University, Halifax, N.S. Professor, Department of Physiology and Biophysics, Dalhousie University, Halifax, N.S. Affiliated Scientist, Queen Elizabeth II Health Sciences Centre, Halifax, N.S., Canada.
Research Interests: Structural and functional changes in glaucoma; Risk factors for the progression of glaucoma; Novel analytical techniques; Experimental optic nerve damage.
Leadership positions: Programme Planning Committee, Glaucoma Section, Association for Research in Vision and Ophthalmology; Scientific Officer, Clinical Investigation (A) Committee, Canadian Institutes of Health Research; Scientific Advisory Committee, Glaucoma Research Foundation; Public Health Committee, Canadian Ophthalmological Society
Paul Chew Tec Kuan, MBBS, MMed (Ophthalmology), FRCS (Ed), FRCOphth, FAMS

Title: Associate Professor, National University of Singapore
Affiliation: Clinical Teacher, Faculty of Medicine, National University of Singapore; Head Glaucoma Service, The Eye Institute, National Healthcare Group; Chief, Department of Ophthalmology, National University Hospital; Senior Consultant, Singapore National Eye Centre; Co-Head, Glaucoma Services, Singapore National Eye Centre.

Research Interest: Laser in Glaucoma research-treatment of Angle Closure Glaucoma (ACG); Accommodative Intra-Ocular Lens (IOL) and presbyopic correction; Anterior segment imaging in relation to Angle Closure Glaucoma (ACG); Medication in Angle Closure Glaucoma (ACG); Brimonidine as a neuro-protective agent in acute primary angle closure glaucoma; Epidemiology of eye disease, risk factors analysis of eye diseases.

George A. (Jack) Cioffi, MD

Title and Affiliation: Chief of Ophthalmology and Director of the Glaucoma Service at Devers Eye Institute, Legacy Health System, Portland, Oregon, U.S.A.
Leadership Positions: Board certified by the American Board of Ophthalmology and is Co-Editor of the Journal of Glaucoma. Editorial board of Focus on Glaucoma, and Graefe’s Archives of Ophthalmology. President of the Oregon Academy of Ophthalmology. He also serves on the FDA Ophthalmology/Dermatology Advisory Committee, the Executive Committee of the American Glaucoma Society, the Ocular Hypertension Treatment Study, the Prevent Blindness America Glaucoma Advisory Committee, the Executive Committee of the Glaucoma Research Foundation, and is Past Chairman of the ARVO, Glaucoma Program Committee.

John S. Cohen, M.D.

Title and Affiliation: Chief Glaucoma Service, Cincinnati Eye Institute, Clinical Professor, VOL., Department of Ophthalmology, University of Cincinnati, Cleveland, Ohio, U.S.A.
Leadership Positions: Clinical Professor – Department of Ophthalmology, University of Cincinnati, College of Medicine.

Anne L. Coleman, MD, PhD

Title and Affiliation: Professor of Ophthalmology, Frances & Ray Stark Chair in Ophthalmology, Jules Stein Eye Institute, David Geffen School of Medicine at UCLA, Los Angeles, California, U.S.A.
She became the Director of the Jules Stein Eye Institute Center for Eye Epidemiology in 1998, Director of the Jules Stein Eye Institute Mobile Eye Clinic in 2000, and a Professor of Ophthalmology and Epidemiology at UCLA in 2003. In 2004, she was the recipient of the Frances and Ray Stark Endowed Chair at UCLA and Senior Achievement and Secretariat awards from the American Academy of Ophthalmology. She is President of Women in Ophthalmology, a member of the US Food and Drug Administration Ophthalmic Devices Panel, an investigator of the Ocular Hypertension Treatment Study, a member of the American Academy of Ophthalmology Health Policy Committee, a member of the US Cochrane Collaboration Eyes and Vision Steering Group and the Chair of the American Academy Of Ophthalmology’s Glaucoma Knowledge-Based Panel. Dr. Coleman is currently Principal Investigator of a collaborative multi-site study funded by the National Eye Institute on the incidence of age-related macular degeneration in elderly women. She has authored or coauthored more than 60 peer-reviewed publications and has given numerous national and international lectures.

Maria Francesca Cordeiro

Title and Affiliation: Institute of Ophthalmology and Moorfields Eye Hospital, Bath Street, London EC1V 9EL United Kingdom
Leadership Positions: Head of Research Group investigating molecular and mechanical mechanisms of glaucoma and retinal neurodegeneration; Wellcome Trust University Lecturer Award; Institute of Ophthalmology, UCL in assoc. with Moorfield’s Eye Hospital; Visiting Professor, New York Eye & Ear Infirmary, New York
Special Honours: International Glaucoma Review Prize for best research paper in glaucoma published worldwide 1999-2000; Wellcome Trust University Award (2001)

Jamie E Craig

Title and Affiliations: Associate Professor Ophthalmology, Flinders University, Consultant Ophthalmologist, Flinders Medical Centre; Australian NHMRC Practitioner-Fellow; Department of Ophthalmology, Flinders University, South Australia, 5042
Research Interests: Glaucoma Genetics, Cataract Genetics
Leadership Positions: Head Glaucoma Clinic – Flinders Medical Centre
Special Awards: Senior Achievement Award American Academy of Ophthalmology (2003); Director of International Relations American Society of Cataract and Refractive Surgery (2003).

Jonathan Crowston MBBS, FRCOphth, PhD

Affiliation: Hamilton Glaucoma Centre, University California San Diego
Research interest: Wound Healing, Apoptosis, Mouse glaucoma models, Aqueous humor dynamics.
Special honors: Pfizer Fellows Award for excellence in glaucoma research, USA (2004); Keeler Scholarship, Royal College of Ophthalmologists, UK (2003); Foulds Trophy, Royal College of Ophthalmologists, UK (1998); Wellcome Trust Vision Research Fellowship, UK (1995).
Michael Diestelhorst, M.D.
Title and Affiliation: Professor of Ophthalmology, University of Cologne, Cologne, Germany.
Research Interests: Glaucoma surgery, ocular pharmacology, fluorophotometry.
Special honors: Glaucoma Award, German Society of Ophthalmology (1993); Research Cup, European Glaucoma Society (2000).

Thomas Dietlein, M.D.
Title and Affiliation: Assoc. Professor, Department for General Ophthalmology, University of Cologne, Cologne, Germany.
Research Interests: Trabecular microsurgery in glaucoma, the developmental glaucomas and cataract surgery combined with glaucoma or vitreoretinal surgery.

Robert D. Fechtner, M.D.
Title and Affiliation: Professor of Ophthalmology, Institute of Ophthalmology and Visual Science, New Jersey Medical School – UMDNJ, Newark, New Jersey, U.S.A.
Research Interests: Glaucoma diagnostic technologies, glaucoma pharmacology, intraocular pressure.

Murray Fingeret, OD
Title and Affiliation: Chief, Optometry Section, Dept Veterans Affairs, New York Harbor Healthcare System, Brooklyn, NY; Professor, State University of New York, College of Optometry
Research Interest: Perimetry, New Technologies and Imaging
Leadership Positions: President, Optometric Glaucoma Society; Chair Glaucoma Diplomat Program, American Academy of Optometry; Chair, Glaucoma Committee, American Optometric Association; Board Member The Glaucoma Foundation.

Josef Flammer, MD
Title and Affiliation: Professor and Head, Department of Ophthalmology, University of Helsinki, Helsinki, Finland; Visiting Professor, Institute of Ophthalmology, University of Cologne, Cologne, Germany; Consulting Ophthalmologist, Moorfields Eye Hospital, London, U.K.
Leadership Positions: Dean, Faculty of Medicine, Basel (1995-1996).
Special Awards: Montgomery Award (2001); William MacKenzie Award (2002); Poster Award SOG (2002); Honorary Professor University of Varna, Bulgaria (2003); Honorary Member of Czech Glaucoma Society and Invited Professor (2003); Honorary Guest Meeting of the Nobel Prize Laureate (2003); Invited Professor Dalhousie University (2004); Medal of the University of Helsinki (2004).

John Gerard Flanagan
Title and Affiliation: Professor, School of Optometry, University of Waterloo, Professor, Department of Ophthalmology and Vision Sciences, Faculty of Medicine, University of Toronto.

Brad Fortune
Title and Affiliation: Associate Scientist, Discoveries in Sight/Devers Eye Institute, Portland, OR; Clinical Instructor, Dept. of Ophthalmology, School of Medicine, Oregon Health Sciences University, Portland, OR; Director, Clinical Electrophysiology Service, Devers Eye Institute, Legacy Health Systems, Portland, OR; Associate Scientist, Legacy Health Systems, Portland, OR, U.S.A.
Research Interests: Visual Function
Special honors: Founding Member, Optometric Glaucoma Society (2002); Irvin and Beatrice Borish Award, American Academy of Optometry (2004).

Paul James Foster
Title and Affiliation: Clinical Senior Lecturer, Department of Epidemiology, Institute of Ophthalmology, University College London; Consultant Ophthalmologist, Glaucoma Service, Moorfields Eye Hospital, London; Research Fellow, Department of Ophthalmology, Norfolk and Norwich University Hospitals NHS Trust, Norwich, UK.
Special Honours: Singapore National Eye Centre Merit Award for Research (1997); Moorfields Eye Hospital Research Prize (2001).

David Steven Friedman
Title and Affiliation: Associate Professor, Wilmer Eye Institute, Johns Hopkins University School of Medicine; As-
Stefano Gandolfi, MD
Title and Affiliation: Professor of Ophthalmology and Chairman of the University Eye Clinic University of Parma, Parma, Italy
Research Interest: Glaucome pharmacology; evaluation of glaucoma surger(ies): non penetrating surgery, Express, trabecular stent etc.; pigmentsary glaucoma; neuroprotection; health economics in glaucoma; contrast sensitivity in glaucoma.
Special honors: EGS award for the best scientific contribution to the quadriennal Meeting in London 2000 and Florence 2004
EGS award for the 3rd scientific contribution to the quadriennal meeting, Paris 1996

David F. Garway-Heath
Title and Affiliation: Consultant Ophthalmologist and Clinical Research Lead - Glaucome Research Unit, Moorfields Eye Hospital, London; Hon. Senior Research Fellow - Department of Visual Science, Institute of Ophthalmology, University College, London, United Kingdom
Research Interests: Research interests include optic nerve head and retinal imaging, measuring visual function, phenotyping, structure/function relationships, measuring disease progression, and determining risk factors for progression.
Leadership positions: Glaucome Society (UK & Eire) (Council member); Imaging Morphometry Association for Glaucome in Europe (Secretary); International Glaucome Association (Trustee); International Perimetric Society (Board member); Editorial Board Member: Eye and Current Eye Research

Doina Gherghe, MD, PhD
Title and Affiliation: Lecturer in Ophthalmology, Neuroscience Research Institute, School of Life and Health Sciences, Aston University, Birmingham, UK.

Christopher A. Girkin, M.D., M.S.P.H.
Title and Affiliation: Associate Professor with Tenure, Director, Glaucome Service, UAB Department of Ophthalmology, 4th Floor Callahan Eye Foundation Hospital, Birmingham, AL, U.S.A.
Research Interests: Develop and evaluating composite measures that quantify glaucomatous damage based on optic disc topographic characteristics and measurements of nerve fiber layer integrity, along with specialized psychophysical and electrophysiologic measures in both African-Americans and Whites; Develop the first three-dimensional digital reconstructions of the human optic nerve head. These unique high-fidelity reconstructions can then be used to test hypothesis that variation in 3D laminar architecture are critical in determining individual susceptibility to glaucomatous injury. Specifically that variation in laminar 3D architecture are associated with well describe risk factors for glaucomatous disease such as increasing age and African-American ancestry.
Leadership Positions: Co-founder and secretary-treasurer of the International Society for Imaging in the Eye (ISIE), member of the editorial board.
Franz Greve, M.D.
Title and Affiliation: Chairman of the Department of Ophthalmology, Josef-Schneider-Str. 11, 97080 Würzburg, Germany.
Research Interests: Basic and clinical research in glaucoma, microsurgery. Laboratory for cell biology in glaucoma research. Prospective Randomized Clinical Studies.
Leadership Positions: Member of the Executive Committee of the European Glaucoma Society; President of the German Society of Ophthalmology (2002-2003); Member of the Executive board of the Glaucoma Society of the International Congress of Ophthalmology (2003); Honorary Member of the Romanian Academy of Medical Sciences (2005).

Franz H. Grus PhD MD
Title and Affiliation: Dept. of Ophthalmology, Universitäts-Augenklinik, Langenbeckstr. 1, 55101 Mainz, Germany
Head of the Experimental Ophthalmology unit: ‘Ocular proteomics and Immunology of the Eye’.

Mingguang He, MD MPH
Title and Affiliation: Associate Director / Associate Professor, Department of Preventive Ophthalmology, Zhongshan Ophthalmic Center; Country Director, Helen Keller International, New York.
Research Interests: Cross-sectional research of glaucoma,
myopia in Chinese; Anterior segment and iris dynamics in the mechanism of angle closure; Natural history of angle closure glaucoma; Evidence-based assessment of the intervention in angle closure glaucoma; Genetic epidemiology of juvenile myopia in Chinese


Special Honors: Graduate Research Scholarship, University College London (2002).


Affiliation: Department of Ophthalmology, University of Sydney, Centre for Vision Research & Western Sydney Eye Hospital, Westmead Hospital, Westmead, NSW 2145, Australia; Eye Associates, Level 4, 187 Macquarie St. Sydney NSW 2000, Australia; Clinical Senior Lecturer: University of Sydney, Department of Ophthalmology, Save Sight Institute & Westmead Millennium Institute; Director of Glaucoma Services, Western Sydney Eye Hospital, NSW; Visiting Medical Officer in Ophthalmology: Westmead Hospital, Sydney/ Sydney Eye Hospital (Assoc), Auburn Hospital, Blacktown-Mt Druitt Hospitals; Director of Glaucoma Research, Centre for Vision Research, Westmead Millennium Institute, Department of Ophthalmology, University of Sydney; Chief Glaucoma Investigator: Blue Mountains Eye Study.

Research Interest: Principal Research Interests; Glaucoma: Ophthalmic Epidemiology & Public Health; Genetic Epidemiology; Cell Biology of ophthalmic diseases; Diagnostic Test & Screening Evaluation; Glaucoma Surgery Research


Anders Heijl

Title and Affiliation: Professor and Head at the Department of Ophthalmology, Malmö University Hospital, University of Lund, Sweden.

Research Interests: Diagnostics, epidemiology and treatment effects

Leadership Positions: President of the International Glaucoma Society of the ICO; Study Director and PI: The Early Manifest Glaucoma Trial (NIH, MFR); Main ophthalmology advisor (Vetenskapligt Råd) for the Swedish National Board of Health and Welfare; Chairman EBM project Open Angle Glaucoma, The Swedish Council on Technology Assessment in Health Care; Chief Editor Acta Ophthalmologica Scandinavica.


D. Heuer

Dr. Heuer received his undergraduate and medical degrees from Northwestern University. He completed his ophthalmology residency at the Medical College of Wisconsin and a two-year National Research Service Award-funded glaucoma fellowship at the Bascom Palmer Eye Institute. Dr. Heuer has published extensively on the use of conventional filtering procedures with wound-healing modulation and aqueous shunting procedures for the management of glaucomas with poor surgical prognoses. He has participated in several glaucoma clinical trials, including the Fluorouracil Filtering Surgery Study, Collaborative Normal-Tension Glaucoma Study, and Collaborative Initial Glaucoma Study. Dr. Heuer currently serves as one of the three Vice Chairs of the National Eye Institute-sponsored Ocular Hypertension Treatment Study. He is Professor and Chairman of Ophthalmology at the Medical College of Wisconsin, where he also serves as the Director of the Froedtert & Medical College Eye Institute.

Roger Hitchings

Title: IGA Professor of Ophthalmology, University of London

Affiliation: Moorfields Eye Hospital London

Research Interest: The process of research, the health economics of glaucoma, normal pressure glaucoma

Leadership position: Senior Specialist Glaucoma Service, Moorfields Eye Hospital; Director of Research & Development Department, Moorfields Eye Hospital; President European Glaucoma Association.

Special Honours: Duke-Elder Lecturer, Royal College of Ophthalmologists; Shaffer lecturer American Academy of Ophthalmology.

Gábor Holló, M.D., PhD, DSci

Affiliation: Director, Glaucoma Service and Perimetry Unit, Department of Ophthalmology, Semmelweis University; President, Glaucoma Section of the Hungarian Ophthalmological Society.

Research interest: Glaucoma (basic science, experimental and clinical research) with special emphasises on imaging, IOP measurement, exfoliation syndrome, blood flow research, medical and laser therapy of glaucoma and wound healing


Anton Bernhard Hommer, M.D.

Affiliation: Oberarzt der Augenabteilung, Krankenanstalt “Sanatorium Hera”, Lustkandlgasse 24; A-1090 Vienna Austria;

Research interest: Glaucoma, clinical trials

Leadership Positions: President of the Viennese Ophthalmological Society Februar 2004 till January 2005 Secretary of the Glaucoma Section of the Austrian Ophthalmological Society since 2001
**Megumi Honjo, MD., PhD.**

**Affiliation:** Department of Ophthalmology, Kitano Hospital, Osaka 530-8480, Japan

**Research interest:** Aqueous outflow, neuroprotection, cell adhesion.

**Leadership positions:** Assistant director, Ophthalmology, Kitano Hospital.

**Special honors:** Suda Glaucoma Research Foundation Research Award (2003); Imai Research Foundation Research Award (2003); JSPS Research Fellowships for Young Scientist Scholarship (1998).

**Michele M. Iester, MD**

**Title and Affiliation:** Contract Professor in ONH Imaging and Neuro-Ophthalmology, University Eye Clinic of Genoa, Italy.

**Research interest:** Glaucoma, ONH imaging, Visual field (white/white and unconventional)

**Special Honors:** The Italian selection to participate to the European Chibret Award (2000); Premium of the Italian Ophthalmological Society for the best semiological work about FDT (2000); Premium of the Italian Ophthalmological Society for the best semiological work about retinal nerve fiber layer measurements (2001).

**Kyoko Ishida M.D.,Ph.D.**

**Title and Affiliation:** Assistant professor, Gifu University Graduate School of Medicine, Gifu, Japan

**Research interest:** Intravitreal application of medication as treatment of intraocular edematous, proliferative and neovascular diseases; Femtosecond laser surgery of the cornea; Contact lens associated ophthalmodynamometry; Accommodative cataract surgery; Near-Infrared inferometry for diagnosis of ocular diseases; Retinal stem cell research; Morphologic diagnosis of optic nerve diseases including the glaucomas

**Leadership positions:** Professor of Ophthalmology and Chairman

**Mohamad Sami Jaafar, MD, FACS, FAAP**

**Title and Affiliation:** Professor of Ophthalmology and Pediatrics, George Washington University Chairman, Department of Ophthalmology, Children’s National Medical Center, Washington, DC; Director, Pediatric Ophthalmology & Strabismus Fellowship Training Program, Children’s National Medical Center, Washington, DC, U.S.A.

**Research Interests:** Infantile Glaucoma. Tonometry in Infants and Children. Amblyopia. Infantile Esotropia. Restrictive Strabismus. Retinopathy of Prematurity. Leadership Positions: Member, Training and Accreditation Committee, American Association for Pediatric Ophthalmology and Strabismus; Member, Membership and Credentials Committee, American Association for Pediatric Ophthalmology and Strabismus.

**Special Honors:** Sauber Excellence in Medicine Award, Washington, DC, February 5, 2005.

**Chris A. Johnson, Ph.D.**

**Title and Affiliation:** Oregon Lions’ Anderson, Chenoweth, Ross Vision Research Chair; Director of Diagnostic Research & Senior Scientist, Devers Eye Institute & Discoveries in Sight Research Labs 1040 NW 22nd Avenue, Suite 200, Portland, OR, U.S.A.

**Research Interests:** Perimetry, visual field testing and psychophysical evaluation of glaucoma and retinal diseases. Development of automated diagnostic test procedures. Imaging and topography of the optic nerve head and retinal nerve fiber layer. Visual factors related to task performance in transportation/aviation and industry. Motion and flicker perception.


**Leadership Positions:** Professor of Ophthalmology and Pediatrics, University Eye Clinic of Genoa, Italy.

**Jost B. Jonas, M.D.**

**Title and Affiliation:** Professor, Department of Ophthalmology, Faculty of Clinical Medicine Mannheim of the Ruprecht-Karls-University Heidelberg, Germany

**Research interest:** Intravitreal application of medication as treatment of intraocular edematous, proliferative and neovascular diseases; Femtosecond laser surgery of the cornea; Contact lens associated ophthalmodynamometry; Accommodative cataract surgery; Near-Infrared inferometry for diagnosis of ocular diseases; Retinal stem cell research; Morphologic diagnosis of optic nerve diseases including the glaucomas

**Leadership positions:** Professor of Ophthalmology and Chairman

**Kenji Kashiwagi, M.D.**

**Research interest:** Clinical investigations: Screening system for angle closure glaucoma. On line supporting system for glaucoma treatment. Pharmacology of anti-glaucoma drugs; Basic science: Pharmacology of anti-glaucoma drugs. Retinal ganglion cell protection.

**Leadership positions:** Professor, Jef- ferson Medical College, Attending Surgeon and Co-Director, Glaucoma Wills Eye Hospital, Philadelphia, Pennsylvania, U.S.A.

**Research Interest:** Dr. Katz has current and past projects include being a participant in the NEI/NIH Glaucoma Laser Trial, the Advanced Glaucoma Intervention Study,
and the Collaborative Initial Glaucoma Treatment Study. Special Honors: American Academy of Ophthalmology’s Senior Achievement Award (2002); Joint Commission on Allied Health Personnel in Ophthalmology’s Faculty Award (2003); Distinguished Alumnus of the Yale University Eye Center (2003).

Paul L. Kaufman, MD/PhD (HC)
Title and Affiliation: Professor and Chair of the Department of Ophthalmology & Visual Sciences at the University of Wisconsin Medical School, Madison, Wisconsin; Peter Duehr Professor and Chairman, U.S.A.
Research Interests: Dr. Kaufman is a physician-scientist, specializing in glaucoma and studying the mechanisms of aqueous humor formation and drainage, and the age-related loss of near vision (presbyopia).
Leadership Positions: Dr. Kaufman is the Past President and current Executive Vice President of the Association for Research in Vision and Ophthalmology, and Past President of the International Society for Eye Research. He has served on the US National Advisory Eye Council and numerous foundation and corporate scientific advisory boards. He has served as a reviewer for all the major eye journals and guest editor or editorial board member for many of them. He has had continuous research funding from the US National Eye Institute for 25 years, has authored nearly 300 original scientific articles and 50 book chapters, co-edited several textbooks including the most recent edition of Adler’s Physiology of the Eye (Kaufman PL, Alm A, eds. Adler’s Physiology of the Eye, Tenth Edition. St. Louis: Mosby, 2002)
Special Honors: Doctor Honoris Causa, Medical Faculty, University of Upsala, Upsala, Sweden (2003); Association of International Glaucoma Societies Award (formerly International Glaucoma Reviews Award) for best glaucoma paper of 2003 (#261: Gabelt BT, Gottanka J, Lütjen-Drecoll E, Kaufman PL: Aqueous humor dynamics and trabecular meshwork and anterior ciliary muscle morphologic changes with age in rhesus monkeys. Invest Ophthalmosc Vis Sci 44:2118-2125, 2003.)

Pung Tee Khaw, PhD FRCS FRCOphth FRCP FIBiol FRCPath FMedSci
Title: Professor of Glaucoma and Ocular Healing and Consultant Ophthalmic Surgeon
Affiliation: Moorfields Eye Hospital and Institute of Ophthalmology, University College London.
Research Interest: Wound healing, tissue repair and regeneration, stem cells, glaucoma surgery techniques, clinical trials.
Leadership Positions: Head, Ocular Repair andRegeneration Unit and Paediatric Glaucoma Service Moorfields Eye Hospital.
Special honours: Chairman ARVO Programme Commit-tee, First ARVO/Pfizer Translational Research Award (2005); 25th Dame Ida Mann Lecture (2004); Alcon Re-
search Award for Scientific Excellence. 12th Sir Stewart Duke Elder Lecture(2003); Elected to British Academy of Medical Sciences (2002); Hunterian Professorship, Royal College of Surgeons, IGR Award for Best Research Paper (1999).

Yoshiaki Kitazawa, M.D., Ph.D
Title and Affiliation: Director, Aka-saka Kitazawa Eye Clinic, Tokyo, Japan; Professor Emeritus, Gifu University, Gifu, Japan.
Research Interest: Glaucoma
Special Honors: Bartisch Award & Lecture (University of Dresden); Goldmann Award & Lecture (IGSICO).

Christoph Kniestedt, MD
Affiliation: Kantonsspital Winterthur, Augenklinik, Brauerstr. 15, CH-8400 Winterthur, Switzerland.

Anastasios G. P. Konotas, MD, PhD
Title and Affiliation: Associate Pro-fessor in Ophthalmology, Head, Glaucoma Unit, A University Dept. of Ophthalmology, AHEPA Hospital, 1 St Kyriaki Str, Thessaloniki 546 36, Greece.
Research Interests: Exfoliation and primary-open angle glaucoma. 24-hour IOP response of all new medi-cations in glaucoma. Relationship between systemic disorders. Compliance in medical the-rapy.
Leadership positions: Board member of the Greek Glau-cocoma Society (2001); Vice President of the Panhellenic Ophthalmological Society (2003).

Theodore Krupin, MD
Title and Affiliation: Clinical Pro-fessor of Ophthalmology, Feinberg School of Medicine, Northwestern University, Chicago, IL, U.S.A.
Research Interests: Current research interests include coordination of a multicenter study of low pressure glaucoma and clinical outcomes of glaucoma surgical therapies.
Special Honors: American Glaucoma Society Presidents Award (2004); 12th Annual Arthur Light, M.D. Lectureship in Ophthalmology, Stritch School of Medicine, Loyola Uni-versity Chicago (2004).
Yasuki Kuwayama, MD, PhD
*Title and Affiliation:* Director of Ophthalmology, Osaka Koseinenkin Hospital and the director of the Institute of Glaucoma in Paris.
*Leadership Positions:* Member of the editorial board of the Journal of Glaucoma Society (EGS), co author of the EGS Guidelines 1998 and 2003 and is a member of the College of Medicine of Paris Hospitals.

Dr. Dennis Shun-chiu Lam
*M.B.,B.S. (HKU); M.D. (CUHK); D.O. (IRELAND); D.O. (GLASGOW); F.R.C.S (EDINBURGH); F.R.C. Ophth (UNITED KINGDOM); F.R.C. Ophth (HONG KONG); F.H.K.A.M. (Ophthalmology)*
*Title and Affiliation:* Chairman of the Department of Ophthalmology, Saint-Joseph Foundation Hospital and the director of the Institute of Glaucoma.
*Research Interests:* Non penetrating surgery and wound healing.
*Leadership Positions:* Member of the editor’s board of the Journal of Glaucoma. Member of the Executive Committee and the Scientific Committee of the European Glaucoma Society (EGS), co author of the EGS Guidelines 1998 and 2003 and is a member of the College of Medicine of Paris Hospitals.

Paul P. Lee
*Affiliation:* James Pitzer Gills III MD and Joy Gills Professor of Ophthalmology, Duke University, Durham, North Carolina; Professor, Department of Ophthalmology, Duke University, Durham, North Carolina, U.S.A.
*Research Interest:* Quality of Care, Patient-Centered Care, Health Care Utilization and Policy, Glaucoma Surgery.
*Special Honors:* Suda Memorial Award, Japanese Glaucoma Society.

Hans G. Lemij, MD, PhD
*Affiliation:* Rotterdam Eye Hospital, Totterdam, The Netherlands.
*Research Interest:* Glaucoma, notably imaging, perimeter and genetic epidemiology.
*Leadership Positions:* Executive Director, Japan Glaucoma Society; Councilor, Japanese Ophthalmological Society; Councilor, Japanese Society for Ocular Pharmacology.
*Special Honors:* Suda Memorial Award, Japanese Glaucoma Society.

Richard A. Lewis, MD
*Title and Affiliation:* Diplomate of the American Board of Ophthalmology and the National Board of Medical Examiners. Former Director of Glaucoma for the University of California, Davis.
*Research Interest:* Glaucoma.
*Leadership Positions:* Associate Editor Archives of Ophthalmology; Section Editor for Mechanisms of Ophthalmic Disease.
*Special Honors:* Dolly Green Special Scholarship from Research to Prevent Blindness and the Marjorie W. Margolin and Sam and Bertha Brochstein prizes from the Retina Research Foundation.

Leonard A. Levin, M.D., Ph.D.
*Title and Affiliation:* Associate Professor in the Departments of Ophthalmology and Visual Sciences, Neurology, and Neurological Surgery at the University of Wisconsin Medical School, Madison, Wisconsin, U.S.A.
*Research Interests:* Clinical: Diseases of the optic nerve. Research on the mechanisms of retinal glial cell death at the molecular, tissue culture, and whole animal level. Focus is on the role axonal damage plays in inducing loss of retinal ganglion cells (an area common to both neuro-ophthalmology and glaucoma).
*Leadership Positions:* Associate Editor Archives of Ophthalmology; Section Editor for Mechanisms of Ophthalmic Disease.
*Special Honors:* Heed Fellowship and the American Academy of Ophthalmology Senior Honor Award.
James D. Lindsey, Ph.D.
Title and Affiliation: Associate Adjunct Professor, Hamilton Glaucoma Center and Department of Ophthalmology, School of Medicine, University of California San Diego, La Jolla, CA, U.S.A.
Research Interests: Interests include cell biology issues contributing to the development of glaucoma, that clarify the damage that occurs in glaucoma, and that underlie interventions to arrest and reverse glaucoma. Recent investigations have used various glaucoma models to clarify the molecular basis of retinal ganglion cell survival, uveoscleral outflow, iris pigmentation, and optic nerve damage.

Brian Little, FRCS FRCOphth
Affiliation: Royal Free Hospital, London, UK
Research Interest: Surgical techniques & instrumentation, postgraduate training.
Leadership Position: UKISCRS Council, Microsurgical Training Committee RCOphth.
Special Honour: UK Ambassador to ORBIS international eye charity.

Elke Lütjen-Drecoll, M.D.
Title: Professor
Affiliation: Full professor and head of the Department of Anatomy II, University of Erlangen/Nuernberg, Germany
Research Interest: Functional morphology of the eye; Glaucoma; Immune Privileg
Leadership Positions: Member of the Academy of Science and Literature, Mainz (1991); Vice-president of the Academy of Science and Literature, Mainz (1997); President of the Academy of Science and Literature, Mainz, Germany (2005).
Special Honors: 2004 Award of the International Glaucoma Symposium (AIGS) in Florenz (2004); Bárány-Award, awarded at the ICER-meeting in Sidney (2004); Ever-Award, awarded at the EVER-meeting in Alicante/Spain (2004).

Giorgio Marchini,
Title and Affiliation: Professor, Head director of the Ophtalmic Clinic, Verona University, Department of Neurological and Visual Science, Verona, Italy.
Research Interest: Glaucoma, ultrasound biomicroscopy, anterior segment surgery, corneal transplantation and ocular tumors.

Dr Silvio Paolo Mariotti Ph.D.
Title: Medical Officer, Ophthalmologist.
Research Interest: Epidemiology, Applied Research, Control strategies particularly in Trachoma, Glaucoma, ARMD, Diabetic Retinopathy.
Leadership Positions: in charge of WHO Global Database on Blindness, publication of global data on visual impairments, development of models and estimates for data on V.I., Global Elimination of Trachoma coordination, Glaucoma control activities.
Special Honors: IOAT Gold Medal (2003); Italian Ophthalmological Society, G.B. Bietti Award 2000.

Keith RG Martin, MA DM MRCP FRCOphth
Title: University Lecturer and Consultant in Ophthalmology
Affiliation: Cambridge University Centre for Brain Repair, Cambridge; Eye Department, Addenbrooke’s Hospital, Cambridge, UK.
Research Interest: Research work is focused on the mechanisms of visual loss in glaucoma and the development of new treatment approaches; Currently developing gene therapy and stem cell techniques to try to prevent visual loss due to glaucoma and ultimately to restore vision in those blind due to the disease.
Leadership positions: AIGS Junior Advisory Group member; • Group Leader at the Cambridge University Centre for Brain Repair.
Special Honors: American Glaucoma Fellows Award Program Merit Award (for Best Research by a Glaucoma Fellow in the USA, 2002); Awarded Doctor of Medicine degree by Oxford University in 2004 for glaucoma research; GSK Clinician Scientist Fellowship, 2005 – 2010.

Felipe Medeiros, M.D.
Title and Affiliation: Assistant Clinical Professor at the Hamilton Glaucoma Center, University of California San Diego, La Jolla, CA, U.S.A.
Research interests: Imaging of the optic disc and retinal nerve fiber layer, development of new methods for early detection of glaucoma, and elucidation of potential risk factors for development and progression of glaucoma.
Leadership Positions: Associate member of the Advisory Board of the Association of International Glaucoma Societies (AIGS); member of the Latin American Glaucoma Society and Association for Research in Vision and Ophthalmology (ARVO).

André Mermod
Title and Affiliation: Head of Glaucoma Unit of the Jules Gonin Eye Hospital, Lausanne, Switzerland, University of Lausanne, Switzerland
Research interest: Glaucoma surgery, structure of Schlemm’s canal.

Georg Michelson, M.D.
Title and Affiliation: Extraordinary Professor, Head of Outpatient Department, Department of Ophthalmology, University of Erlangen-Nuremberg, Erlangen, Germany.
Research Interests: Automatic Glaucoma Screening; Ocular Circulation in Glaucoma; Telemedical Assessment of Retinal Images; Tele-education in Ophthalmology.

Clive Migdal, MD FRCS FRCOphth
Affiliation: Western Eye Hospital, London
Research Interest: Glaucoma therapeutics
Leadership Positions: Secretary, European Glaucoma Society; Co-Chairman, Meetings Committee, AIGS; Editorial Board, Journal of Glaucoma.

Stefano Miglior, MD
Title and Affiliation: Professor of Ophthalmology, Department of Neurosciences, University of Milan Bicocca, Head of the Department of Ophthalmology, Policlinico di Monza, Monza (MI), Italy.
Research Interest: Glaucoma (all areas); Imaging of the optic disc and RNFL; Visual field evaluation; Medical therapy of glaucoma; Clinical trials.
Leadership positions: Principal Investigator of the study: ‘European Glaucoma Prevention Study’. Funded by the European Commission in the BIOMED 2 program and Merck; Co-Investigator of the study: ‘EGPS-OHTS Collaborative Analysis’. Funded by the National Eye Institute; Member of the Scientific Board of the ‘International Society of Imaging in the Eye (ISIE)’; Member of the Executive Committee of the ‘Italian Association for the Study of Glaucoma (AIGS)’; Member of the Executive Committee of the ‘Ophthalmological Society of Lombardia (Italy)’.

Don S. Minckler, MD
Title: Professor of Ophthalmology – Emeritus Director of Glaucoma Services
Affiliation: Doheny Eye Institute & University of Southern California (Keck) School of Medicine Los Angeles, California
Research Interests: Ocular pathology; pathophysiology of aqueous shunts, glaucoma surgery

Stephen A. Obstbaum, M.D.
Title and Affiliation: Chairman, Department of Ophthalmology, Lenox Hill Hospital, Professor of Ophthalmology NYU School of Medicine, New York, NY, U.S.A.
Research Interests: Cataract, glaucoma and ocular inflammation.

Orgül, Selim I.
Title and Affiliation: Professor, Chief, Department of Diagnostics and Research, University-Eye-Clinic, Mittlere Strasse 91, Postfach, 4012 Basel, Switzerland.
Leadership Positions: President, Group glaucoma of the Swiss Ophthalmic Society; Board member, European Association for Vision and Eye Research (EVER); President, Association for Continuing Education in Ophthalmology; Editorial Board member, British Journal of Ophthalmology.

Neville N. Osborne
Title and Affiliation: Professor of Ocular Neurobiology at the Department of Ophthalmology in Oxford, UK.
Research Interests: Research aimed at understanding how cells in the retina die following defined insults and devising possible ways of preventing their death. The aim is to develop drug therapy to treat retinal degenerating diseases such as glaucoma and age-related macular degeneration.
Leadership Positions: Chief editor of Progress in Retinal and Eye Research, International Section Organiser for the Retinal Section, for the Geneva ICER meeting. Past Vice-President European Association for Vision and Eye Research.
Mona Pache, MD
Affiliation: University Eye Clinic Freiburg, Germany
Research interest: Glaucoma: Systemic findings in glaucoma patients, IOP measurement methods, pachymetry, ocular blood flow in glaucoma, new diagnostic tools in glaucoma.

Paul Palmberg, MD, PhD
Title: Professor of Ophthalmology.
Affiliation: Bascom Palmer Eye Institute, University of Miami, Miller School of Medicine, Miami, Florida, U.S.A.
Research Interest: Clinical trials in glaucoma, evidence-based target pressures, antimetabolite filtering surgery, techniques for managing post-operative complications of glaucoma surgery, natural history of diabetic retinopathy, corneal transplant tissue culture media.
Leadership positions: Past-president of the Pan-American Glaucoma Society.
Special honors: Co-recipient of the IGR Award (2000 publication) for the AGIS 7 paper; Co-recipient of the Banting and Best Award (American Diabetes Association) for the Diabetes Control and Complications Trial; Shaffer Lecture, American Academy of Ophthalmology

Vincenzo Parisi, M.D.
Title and Affiliation: Head of the section Neurophysiology of Vision and Neuroophthalmology, G.B. Bietti Foundation, Via Livenza 7, Rome; Professor, Neuroophthalmology at the School of Specialisation in Neurology of the University of Rome ‘La Sapienza’; Professor, School of Specialisation in Neuropsychopathology of the University of Rome ‘Tor Vergata’, Rome, Italy.
Research Interests: Clinical and experimental research activities on the Neurophysiology of Vision (visual plasticity and neurosensorial mechanisms) and Neuroophthalmology (glaucomatous, diabetic, and demyelinating neuropticopathies).

Richard Kenneth Parrish II
Title and Affiliation: Professor, Department of Ophthalmology, University of Miami School of Medicine, Miami, Florida, U.S.A.
Leadership Positions: Member of NEI Special Emphasis Panel (ZEY1-VSN-01)(2003);

Rodolfo A. Pérez Grossmann, MD
Title and Affiliation: Chairman of the “Instituto de Glaucoma y Catarata”, Lima - Peru

Norbert Pfeiffer, M.D.
Title and Affiliation: Professor, Head, Department of Ophthalmology
Research Interest: Glaucoma, Medical Therapy, Surgical Therapy, Diagnosis.

Lutz E. Pillunat, M.D., Ph.D.
Title and Affiliation: Professor, Chairman, Augenklinik und Poliklinik, Medizinische Fakultät Carl Gustav Carus, Dresden, Germany.

Bruce E. Prum, JR., M.D.
Title and Affiliation: Associate Professor of Ophthalmology, Department of Ophthalmology, University of Virginia, Charlottesville, Virginia, U.S.A.
Research Interests: Clinical trials of surgical management of glaucoma. Clinical trials of Latanaprost.
Special Honors: ‘Most outstanding professor of the year’ teaching Award, Department of Ophthalmology, University of Virginia (2004).

Harry A. Quigley, M.D.
Title and Affiliation: Director, Glaucoma Service, Director, Dana Center for Preventive Ophthalmology, Wilmer Institute, Johns Hopkins University, Wilmer 120, Johns Hopkins Hospital, Baltimore, Maryland, U.S.A.
Research Interest: Glaucoma
Special Honors: Senior Honor Award, American Academy of Ophthalmology (1997); International
Glaucoma Review Award, Best Paper of the Year (2000); L. Harrell Pierce Teaching Award, Wilmer Residents (2003, 2nd time); Friedenwald Award, Association for Research in Vision and Ophthalmology (2004); Doyne Medal, Oxford Ophthalmological Congress (2004); Friedenwald Award (2004).

Anthony D. Reaolini, MD
Title and Affiliation: Associate Professor of Ophthalmology, West Virginia University, Morgantown, WV, U.S.A.
Research Interests: Spontaneous IOP fluctuations; structural and functional optic nerve testing.
Leadership Positions: Departmental Clinical Research Committee, Chair (WVU) 2004-present

Robert Ritch, M.D.
Title and Affiliation: Professor, Department of Ophthalmology, New York Eye & Ear Infirmary, New York, NY, U.S.A.
Research Interest: Glaucoma.
Leadership Positions: Board of Directors, The Glaucoma Foundation; New York, NY (1983 - ); Board of Directors, South Eastern Nigeria Eye Care Outreach, College of Medical Sciences, University of Calabar, Calabar, Nigeria (1996 - ); Board of Directors, New York Eye and Ear Infirmary (2004 - ); Man of the Year, The Glaucoma Foundation (2000); Jesse H. Neal Award for Editorial Achievement (2000).

Cynthia Roberts, Ph.D.
Title and Affiliation: Associate Professor of Ophthalmology, Biomedical Engineering and Surgery, Torrence A. Makley Research Professor in Ophthalmology, The Ohio State University, Columbus, Ohio, U.S.A.
Research Interests: Corneal topography and corneal biomechanical response to laser refractive surgery.
Leadership Positions: Panel member of the Ophthalmic Devices Panel of the FDA.

Prin RojanaPongpun, MD
Title and Affiliation: Chief, Glaucoma Service & International Affairs, Department of Ophthalmology, Chulalongkorn University & Hospital; Queen Sirikit National Institute of Child Health, Ministry of Public Health; Bumrungrad International Hospital.
Research interests: Pseudoexfoliation syndrome, glaucoma, ophthalmompathology, cornea, extracellular matrix.
Leadership positions: Associate professor, lecturer, and chief of research laboratory at the Department of Ophthalmology, University Erlangen-Nürnberg.

Michal Schwartz, Ph.D.
Affiliation: Department of Ophthalmology, University of Erlangen-Nürnberg, Erlangen, Germany.
Research interests: Pseudoexfoliation syndrome, glaucoma, ophthalmompathology, cornea, extracellular matrix.
Leadership positions: Associate professor, lecturer, and chief of research laboratory at the Department of Ophthalmology, University Erlangen-Nürnberg.
Special honors: Career Woman of the year 2000, Israel; ARVO Award for outstanding research in the basic or
clinical sciences as applied to ophthalmology (Friedenwald Award) (2002); The International Glaucoma Review Award for daring, breakthrough, creative, original research in glaucoma (2002).

Tarek Shaarawy, MD
Title and Affiliation: Head of Glaucoma Department, in the University of Geneva, Switzerland.
Research Interests: New surgical techniques of glaucoma surgery.
Leadership Positions: Secretary General of the International Society of Glaucoma Surgery.

Peter Shah, BSc(Hons) MB ChB FRCOphth
Title and Affiliation: Consultant Ophthalmic Surgeon, Birmingham and Midland Eye Hospital / Good Hope Hospital NHS Trust, Birmingham, U.K.
Research Interests: Complex glaucoma surgery, juvenile glaucoma, glaucoma in African-Caribbean eyes, anterior segment reconstructive surgery and trauma surgery.
Leadership Positions: Glaucoma co-editor for ‘Eye’.

Ramanjit Sihota MD, FRCS
Title and Affiliation: Head of the Glaucoma research facility and clinical services at Dr Rajendra Prasad center for Ophthalmic Sciences, All India Institute of Medical Sciences, New Delhi, India.
Research Interests: Primary angle closure glaucoma, imaging, surgical techniques and drug therapy in glaucoma.
Leadership Positions: Member of the Ethics Committee at the All India Institute of Medical Sciences.
Special Honors: Dr. P. Siva Reddy Award for Ophthalmic Research (1998); D B Chandra Award for Glaucoma research (1999); AC Agarwal trophy (2004); Silver salver for a poster presentation at the European Glaucoma society meeting (2004).

Kuldev Singh, M.D., M.P.H.
Title and Affiliation: Professor of Ophthalmology, Director, Glaucoma Services, Department of Ophthalmology, Assistant Dean for Medical Student Advising, Stanford University School of Medicine, Stanford, California, U.S.A.
Leadership Positions:

Gregory L. Skuta, MD
Title: James P. Luton Clinical Professor
Affiliation: Dean A. McGee Eye Institute, University of Oklahoma Health Science Center, Oklahoma City, Oklahoma, U.S.A.
Research Interests: Wound healing in glaucoma filtering surgery. Participation in multicenter clinical and surgical trials.
Leadership Positions: President, American Glaucoma Society; Secretary for Ophthalmic Knowledge, American Academy of Ophthalmology; Director, American Board of Ophthalmology; Board of Governors, Association of International Glaucoma Societies; Editorial Board, Journal of Glaucoma.
Special Honors: Active Member, Glaucoma Society of the International Congress of Ophthalmology.

George L. Spaeth, M.D.
Title and Affiliation: Louis J. Esposito Research Professor, Director, Glaucoma Service, Wills Eye Hospital, Philadelphia, Pennsylvania, U.S.A.
Leadership Positions: E. B. Spaeth Clinical Research Foundation: Founder and President; Eye Disease Foundation: Founder and President; Wills Eye Hospital Glaucoma Service Foundation to Prevent Blindness: Founder and President
Special Honors: Selected as one of the Best Ophthalmologists in America by a survey of the Chairmen and Directors of Residency Training Programs in the United States (1999); American Academy of Ophthalmology, Lifetime Achievement Award (2000).

Robert L. Stamper, M.D.
Title: Professor and Director of the Glaucoma Service.
Affiliation: University of California, San Francisco (UCSF), San Francisco, California, U.S.A.
Research Interest: Early diagnosis, Surgical approaches, pharmacology of glaucoma.

Remo Susanna Jr., MD
Title and Affiliation: Associated Professor in Ophthalmology.
Ernst R. Tamm, MD
Title: Professor and Chairman
Affiliation: University of Regensburg, Institute of Human Anatomy, Regensburg, Germany.
Research Interests: Molecular pathogenesis of primary open-angle glaucoma; control of gene expression in the outflow pathways of aqueous humor; Development of genetically engineered mouse models for primary open angle glaucoma; Molecular regulation of anterior eye development.
Leadership Positions: Professor and Chairman, Institute of Human Anatomy, University of Regensburg, Regensburg, Germany; Associate Professor and Head of Section Molecular Anatomy and Embryology, Department of Anatomy, University of Erlangen-Nürnberg, Erlangen, Germany. Member Editorial Board ‘Experimental Eye Research’, Section Editor ‘Aqueous Humor and Outflow Pathways’; Member Editorial Board ‘Current Eye Research’; Member Scientific Advisory Committee of the Glaucoma Research Foundation, San Francisco, CA.

Hidenobu Tanihara, M.D.
Title and Affiliation: Professor and Chairman, Department of Ophthalmology & Visual Science, Kumamoto University, Graduate School of Medical Sciences, Honjo 1-1-1, Kumamoto 860-8556, Japan.
Special Honors: Suda Award from Japan Glaucoma Society (1999).

Gülgün Tezel, M.D.
Title and Affiliation: Associate Professor, Department of Ophthalmology & Visual Sciences, Department of Anatomical Sciences & Neurobiology, University of Louisville School of Medicine, Louisville, Kentucky, U.S.A.
Special Honors: Recipient of the 2004 Research to Prevent Blindness Sybil B. Harrington Scholars Award.

Ravi Thomas M.D.
Title and Affiliation: Director, L.V. Prasad Eye Institute, Hyderabad, AP, India.
Research Interests: Glaucoma, Strabismus & Cataract.
Special Honors: WHO consultant for Development of a draft National Plan of Action For Control of Blindness in Jordon, July 1999.

John Thygesen, MD
Title and Affiliation: Associate Professor, Director of the Glaucoma Clinic, Copenhagen University Eye Clinic, Dept. of Ophthalmology, Rigshospitalet, University of Copenhagen, Copenhagen, Denmark.
Research Interest: Glaucoma: Ocular pharmacology, Glaucoma medical therapy, Glaucoma surgery, Lasers and Epidemiology.
Leadership positions: Member of the Executive Committee and the Educational Committee of The European Glaucoma Society (EGS). EGS representative at the Association of International Glaucoma Societies.

Title and Affiliation: Consultant Ophthalmologist/Chief, Glaucoma, Division – Beirut Eye Specialist Center, Rizk Hospital – Beirut, Lebanon.
Special Honors: Gold Medal Award – Pan Arab Council of Ophthalmology 1997

Carlo Enrico Traverso, M.D.
Affiliation: Clinica Oculistica, Department of Neurosciences, Ophthalmology and Genetics, University of Genova, Italy.
Research interests: Psychophysics, surgery, imaging, stem cells.
Leadership position: Executive Committee of the European Glaucoma Society (at present). Program Planning Committee Chair – Glaucoma, ARVO (1998); Steering Committee for the Association of International Glaucoma Society; Executive Committee for the Associazione Italiana per lo Studio del Glaucoma; Special Honors: Italian Ophthalmological Society Award for clinical research in 1991, the American Academy of Ophthalmology Honor Award in 1993 and the AIRCMO Award for research in ophthalmology in 1999.

Anja Tuulonen
Title and Affiliation: Professor, Department of Ophthalmology, University of Oulu, Finland.
Leadership positions: Committee for Continuous Medical Education, University of Oulu.

Ananth C Viswanathan BSc (Hons) MBBS(Lond) FRCOphth MD
Affiliations: Consultant Surgeon (Glaucoma), Moorfields Eye Hospital, London; Honorary Senior Clinical Research Fellow, Inst. of Ophthalmology, London; Member of Statistical Genetics Group, Inst. of Psychiatry, London, United Kingdom.
Leadership positions: Chairman of GlaucoGENE (European Glaucoma Society Genetic Epidemiology Network); Chairman of UK Glaucoma Early Diagnosis Programme; Member of AIGS Junior Advisory Board; Member of European Glaucoma Panel.
Special honors: Member of Honorary Medical Advisory Panel to the Secretary of State on Visual Disorders and Driving.

Peter Walter, M.D.
Title and Affiliation: Professor of Ophthalmology, Director and Chairman, Department of Ophthalmology, Technical University Aachen, Germany.

Ning-Li Wang, MD. PhD.
Title and Affiliation: Chairman of Beijing Tong Ren Eye Center; Professor of Ophthalmology; Doctorial Tutor of Ophthalmology; Director of Glaucoma Department; Beijing, People’s Republic of China.
Research Interests: Gene therapy. Treatment of glaucomatous optic neuropathy.

Robert N. Weinreb, M.D.
Title and Affiliation: Distinguished Professor of Ophthalmology, Director, Hamilton Glaucoma Center, University of California, San Diego, La Jolla, California, U.S.A.
Research Interests: Glaucoma diagnosis. Optic nerve (optic disc and retinal nerve fiber layer) imaging. Molecular and cellular mechanisms of aqueous outflow. Molecular and clinical aspects of glaucoma neuroprotection. Wound healing and glaucoma surgery.
Leadership Positions: President, Association of International Glaucoma Societies (AIGS); President-Elect, American Glaucoma Society (AGS); Board of Governors, Association of International Glaucoma Societies (AIGS).
Special Honors: Helmholtz Award for Research Excellence; AIGS-Award for Outstanding Glaucoma Research; Research to Prevent Blindness Physician-Scientist Award; Best Doctors in America; University of California San Diego, Outstanding Teacher.

Dr Tony Wells
Title and Affiliation: Senior Lecturer, Wellington School of Medicine, Wellington, New Zealand.
Leadership positions: Head of Ophthalmology Unit, Wellington School of Medicine.

Wheeler, Larry A., PhD
Research Interest: Cell signaling and neuroprotection; glaucoma; aqueous humor dynamics; pharmacology; photoreceptor protection; apoptosis; alpha-2 agonists; NMDA receptors; glutamate; Ca2+ homeostasis.
Leadership positions: Senior Vice-President, Biological Sciences, Discovery Research, Allergan, Inc., Irvine, CA

Richard P. Wilson
Title and Affiliation: Professor of Ophthalmology, Jefferson Medical College, Philadelphia, Co-Director, Glaucoma Service, Wills Eye Hospital, Philadelphia, Pennsylvania, U.S.A.
Research Interests: Emerging techniques of glaucoma therapy, with special emphasis on laser and cutting surgery, and pediatric glaucoma.
Leadership Positions: Outgoing President of the American Glaucoma Society; Board of the Eye Care America Glaucoma Program, the American Academy of Ophthalmology’s Foundation; Board of the Association of International Glaucoma Societies; Editorial Board of Ocular Surgery News.

M. Roy Wilson, M.D., M.S.
Title and Affiliation: President of the Texas Tech University Health Sciences Center, Lubbock, Texas, U.S.A.
Research Interest: Epidemiology and ophthalmology, especially in fostering the evolving field of glaucoma epidemiology.
Leadership Positions: Advisory Council and as Chair of the Strategic Plan Subcommittee for the National Center on Minority Health and Health Disparities (NIH). Elected lifetime membership in the Institute of Medicine of the National Academy of Sciences.
Wormald, Richard Piers Lesley, MSc
Title and Affiliation: Consultant Ophthalmologist, Moorfields Eye Hospital and Honorary Senior Lecturer, Institute of Ophthalmology and London School of Hygiene and Tropical Medicine, London, United Kingdom.

Tetsuya Yamamoto, MD
Title and Affiliation: Professor and Chairman, Department of Ophthalmology, Gifu University Graduate School of Medicine, Gifu-shi, Japan.
Research interest: Glaucoma management.
Leadership Positions: Glaucoma Society of the ICO (Active Member); Japan Glaucoma Society (Board Member).
Special Honors: Suda Award, Japan Glaucoma Society (1994).

Yeni H. Yucel MD PhD FRCPC (Neuropathology)
Title and Affiliation: Associate Professor, Director, Ophthalmic Pathology Laboratory, University of Toronto; Department of Ophthalmology & Visual Sciences, University of Toronto, Department of Laboratory Medicine & Pathobiology, St. Michael’s Hospital, Toronto, Canada.
Research interest: Neuropathology of central visual pathways in glaucoma and neuroprotection.
Leadership positions: Director, Ophthalmic Pathology Laboratory, University of Toronto.

Linda M. Zangwill, Ph.D.
Title and Affiliation: Professor, Director, Diagnostic Imaging Laboratory, Department of Ophthalmology, University of California, San Diego, La Jolla, California, U.S.A.
Research Interests: To characterize structural damage in glaucoma using optical imaging instruments. To improve techniques for detection and monitoring of glaucomatous structural damage. To develop improved methods to measure the rate of glaucomatous progression. To characterize the complex relationship between structural and functional change over time. To identify risk factors for the development and progression of glaucoma.

Zhao, Jialiang, M.D.
Title and Affiliation: Director and Professor, Department of Ophthalmology, Beijing Union Medical College Hospital, Beijing; Professor, Department of Ophthalmology, PUMC Hospital, Eye Research Center, Chinese Academy of Medical Sciences, Beijing, China.
Research Interests: Glaucoma. Ophthalmic epidemiology.
Leadership positions: President, Chinese Ophthalmological Society; Editor-in-Chief, Chinese Journal of Ophthalmology; Member of Academia Ophthalmologiica Internationalis.
Special honors: He is receiver of the Kupfer Award for Prevention of Blindness in 1999.
WORLD GLAUCOMA CONGRESS
This Meeting
The World Glaucoma Congress (WGC) was created because:
- Glaucoma needs a global meeting
- Glaucoma Societies need to get together / global communication
- AIGS is in the position to provide the highest quality meeting following its own Guidelines on Quality of Glaucoma Meetings, Guidelines on Reporting and Publishing and the Code of Practice, avoiding commercialization
- Glaucoma Societies and Glaucoma Industry Members have similar ethical scientific standards
- The WGC could serve as an example for other meetings
- The WGC will be a powerful stimulus for progress in glaucoma worldwide
- The WGC will have enhanced cost-effectiveness; it will be a non-profit meeting.

The WGC is primarily a didactic event. The participant should find a host of practical topics in addition to information on the latest developments of glaucoma science.

Target Groups
The WGC targets the Glaucoma Specialist as well as the General Ophthalmologist, who after all takes care of most of the glaucoma patients.

The WGC concept
- All star faculty (140 invited speakers)
- Oral presentations by invited faculty only
- Short and concise didactic lectures in the morning.
- Extensive courses in the afternoon
- Latest developments in four sessions (two opening sessions, sessions on ‘From Science to Clinic’ and ‘Clinician Scientists: The Future of Glaucoma’)
- Scientific posters, walkthrough, session, recognition
- Glaucoma Society sessions with nominated lectures by Glaucoma Society selected speakers and extensive discussion
- Personal contact with faculty in ‘Meet the Expert’ breakfast session
- Glaucoma Industry session under the responsibility of the organizing industry following the Guidelines on Quality and Quantity of Glaucoma Meetings.
- Evidence Based quality of presentations
- Various types of discussion
- Interactive questions
- Continuous Medical Education Credits
- Disclosure
- Evaluation
- Global AIGS-Award

Committees

WGC program Committee

Inaugural Assembly (Wednesday morning)

Opening, Opening Lectures, Opening Symposium (Wednesday afternoon)

Morning Lectures, Symposia, Round-table, etc. (Thursday, Friday, Saturday morning)

Glaucoma Societies (Thursday, Friday, Saturday afternoon)
Courses (Thursday, Friday, Saturday afternoon)

Scientific Posters

GIM Sessions

Consensus on Surgery

Social Program Committee

Local Host
M. Eckhardt, C. Faschinger, P. Freigasser, A.B. Hommer (chair), A. Mistlberger, G. Rainer, K. Rigal, B. Teuchner, C. Vass
SCIENTIFIC PROGRAM OVERVIEW

Opening Ceremony
The Opening Ceremony has two themes. The first theme, ‘Alle Menschen werden Brüder’ (Brotherhood unites all men) from Ludwig von Beethoven’s Ninth Symphony symbolizes the global cooperation that the AIGS aims for. In his opening speech, the President will stress this aspect of the AIGS. The second theme is: glaucoma, the threat to vision; science is the drive behind halting glaucomatous progression; the AIGS vision of a united glaucoma world and, last but not least, the insight that may come to scientists beyond all reasoning (as great scientists like Einstein have expressed).

The music and text for this glaucoma hymn were specially written for the AIGS and the World Glaucoma Congress.

Opening Symposia
The Opening Symposia deal with important aspects of glaucoma as a cause of blindness, developments in basic glaucoma research that is on the threshold of clinical application.

Didactic Morning Sessions and Instruction Courses
The Didactic Morning Sessions consist of short and concise presentations by experts on all aspects of Glaucoma Management. They form an inseparable unity with the courses. The morning lectures and discussions should be seen as a pointwise presentation of the latest insights in Glaucoma Management. The courses will elaborate on many of the same topics in more detail and in exchange with the participants.

Global Guidelines on Diagnosis and Treatment
Several member societies of the AIGS (AGS, EGS, JGS, SEAGIG) have made Guidelines for Diagnosis and Treatment. These Guidelines reflect the specific economical and geographical situation in each of the regions covered by these Guidelines. The AIGS will attempt to create a general global overview of these Guidelines with emphasis on similarities as well as on differences. A short report on these Guidelines will be presented on Friday, July 8, 11.50 AM (D61)

From Science to Clinic (062 – D068)
This session aims at presenting developments in science that may have an impact on clinical practice in the future. Speakers are all clinicians involved in science, with the exception of Elke Lütjen-Drecoll, who is a professor of anatomy. Each presentation will be summarized in plain words by the chairs. The session will start with an explanatory introduction and will end with a brief overview by the chairs.

Consensus on Structure and Function
The Consensus on Structure and Function (held in November 2003) was published in the book ‘Glaucoma Diagnosis: Structure and Function’ in 2004. A Consensus is an ongoing process that needs updating at regular intervals, especially in a field that moves so rapidly as the diagnosis of structural and functional abnormalities. A short update will be presented on Thursday July 7, 9.50 AM (D26). A complete update is envisaged as part of the regular AIGS Consensus Program.

Consensus on Glaucoma Surgery : Open Angle Glaucoma
A Consensus Meeting with more than 90 experts was held on April 30, 2005 in Fort Lauderdale, Florida, US. The results of this second Global AIGS Consensus Meeting on Glaucoma Surgery will be published in a book. A complete session of the WGC will be devoted to the Consensus Statements which will be presented and discussed Saturday, July 9, 10.30 AM – noon (D83 – D96).

The Future of Glaucoma: Clinician Scientists
The AIGS recognizes the vital position of the glaucoma clinician scientists. This session has the symbolic name ‘The Future of Glaucoma’ indicating how much the development of glaucoma science, and subsequently diagnosis and treatment, depends on the clinician scientists. The presenting clinician scientists in this session were nominated by the member glaucoma societies of the AIGS. The presenting six were selected by the Program Committee. Robert Weinreb will summarize the future of Glaucoma Research. The final Future of Glaucoma lecture will be presented by Roger Hitchings. Saturday, July 9, 4.30 – 5.30 PM (D106 – D113).

Posters
It should be emphasized that the AIGS has purposely chosen scientific posters as the only mode of free, original presentations at the congress. Posters are an excellent and important way of providing scientific information. The AIGS is making an effort to provide high visibility for the posters, by declaring them to be the exclusive medium for free presentations.

The posters will be on from Wednesday July 6 noon till Saturday July 9, 5.00 PM.

Poster Mounting and Removing
Posters should be mounted on Wednesday, July 6, between 09.00 AM - noon. After 12.00 hours no posters can be mounted. Assistance and material for mounting the posters (tape) will be available from 09.00 AM, at the desk in the Poster area.
Posters should be removed after 14.00 and before 17.00 hours on Saturday, July 9. Posters that have not been taken down by the author(s) will be removed and destroyed by the AIGS Meeting Office.

**Poster Walk-through**
Apart from the individual visits of participants to the posters there will be an official visit by the WGC Poster Committee, AIGS Board of Governors, Steering Committee and Glaucoma Society Representatives. The poster authors have to be present at their poster on Thursday, July 7, during the Poster Walk-through 4.45 PM – 5.45 PM. Authors are requested to indicate on their posters other times they will be available at their poster. This usually will be during one of the breaks.

The Glaucoma Society Structure posters will also be visited during the Poster Walk-through.

**Poster Session**
The selection of the Top-ten posters that will be discussed during the Poster Session will be done during the Poster Walk-through. The selected posters will be indicated by a selection sign which will be attached to the poster at 6.00 PM.

Authors should check their poster board immediately on Friday morning, July 8, for a sign that indicates selection for the poster session. If their poster is selected, authors should report to the poster session administrator for instructions. The Top-ten selected poster authors will present their poster in two slides (3 minutes) during the poster session on Friday afternoon (July 8, 4.30-6.00 PM). Following this presentation the poster will be discussed by members of the poster committee and their invited discussants (5 minutes per poster).

**Poster Recognitions**
At the end of the Poster Session the Poster Committee will announce the three best posters which will receive the World Glaucoma Congress Poster Recognition.

**Special Attention Flags**
Apart from the selection of posters for the Poster Session and Recognition the Poster Committee will give special attention flags to posters that have caught the special attention of the members of the Poster Committee, other than those selected for the poster session.

**Meet the Experts Breakfast Table Discussions**
A unique occasion to discuss questions of practical importance with members of the faculty will be the ‘Meet the Expert’ breakfast sessions. There will be 15 tables, each with two experts and eight participants, on Thursday and Friday morning. Total 42 tables, i.e. place for 336 registrations. Cost: zero. Time: 7.30-8.15 AM. Location: Restaurant Piazza on the first floor in the Conference Center.

Organization: the attendees may prepare questions to the faculty members, who will discuss the subject of the question. Discussion time per question will be 5 minutes maximum so as to allow each participant at least one question. There will be no projection. Information on cases should be provided on paper or by means of a laptop.

**Table chairmen:**

**Thursday, July 7, 2005. 07.30 – 0815.**
Table 1: D.S. Minckler and F. Grehn
Table 2: S. Obstbaum and J.B. Jonas
Table 3: P. Palmberg and A.G.P. Konstas
Table 4: R.K. Parrish and Y. Lachkar
Table 5: P. RojanaPongpun and H.G. Lemij
Table 6: T. Wells and N. Pfeiffer
Table 7: R. Ritch and T. Shaarawy
Table 8: Shields and P. Shah
Table 9: K. Singh and A. Tuulonen
Table 10: G.L. Skuta and R.P.L. Wormald
Table 11: G.L. Spaeth and M. Araie
Table 12: R.L. Stamper and R. Burk
Table 13: Rick Wilson and S. Melamed
Table 14: Roy Wilson and J. Ge
Table 15: I. Goldberg and D. Grigera
Table 16: S. Gandolfi and W.L.M. Alward
Table 17: R.A. Hitchings and I.K. Ahmed
Table 18: P.T. Khaw and P.R. Healey
Table 19: C. Migdal and M.S. Jaafar
Table 20: A.L. Coleman and C. Traverso
Table 21: A. Alm and G.C. Sekhar
Table 22: D.F. Garway-Heath and T. Wells

**Friday, July 8, 2005. 07.30 – 0815.**
Table 1: J.D. Brandt and G. Marchini
Table 2: D.L. Budens and S. Miglior
Table 3: C.F. Burgoyne and A. Mermoud
Table 4: C.B. Camras and P. Mitchell
Table 5: J. Caprioli and D. Lam
Table 6: G.A. Cioffi and T. Yamamoto
Table 7: A.S. Crandall and L.E. Pillunat
Table 8: R.D. Fechtner and G. Michelson
Table 9: C.A. Girkin and J. Thygesen
Table 10: D.S. Greenfield and H. Tanihara
Table 11: R.L. Gross and R. Thomas
Table 12: D.K. Heuer and Y. Kuwayama
Table 13: A.D. Realini and K.F. Tomey
Table 14: L.J. Katz and A. Azuara Blanco
Table 15: P.L. Kaufman and R. Susanna
Table 16: T. Krupin and R. Sihota
Table 17: R.P. LeBlanc and K. Barton
Table 18: P.P. Lee and C. Baudouin
Table 19: L.A. Levin and R.G. Carassa
Table 20: R.A. Lewis and M. Diestelhorst
Table 21: J.M. Liebmann and J. Flammer

Glaucoma Industry Member Symposia and Workshops
The Glaucoma Industry Members (GIM) will organize their own Symposia and Workshops. This has been done in concert with the WGC organization. The GIM organizer holds responsibility for the scientific content of the GIM Symposia and Workshops. See p. 47 for AIGS Rules on Glaucoma Industry Member involvement.

Discussions and Interactive Questions
The WGC will have the following types of discussions:
• Invited panel discussions (Didactic Morning Sessions, Glaucoma Society Sessions)
• Open discussions during the courses and Meet the Expert breakfast tables
• Poster discussions during o Walk-through: general o Poster Session: Poster Committee

In addition to the discussions there will be frequent interactive questions (IAQ) during most of the sessions, in order to give the participants the opportunity to express their opinion on several issues discussed at the WGC. IAQ may also be used to measure the impact of lectures or discussions on participant management decisions.

Language
English.

Quality of Evidence
Global AIGS Guidelines on Reporting and Publishing, and on Quality and Quantity of Glaucoma Meetings
From the beginning the AIGS has emphasized the importance of scientific quality of its presentations and discussions. It has therefore published two reports that deal with these quality aspects: Global AIGS Guidelines on Reporting and Publishing, and Global AIGS Guidelines on Quality and Quantity of Glaucoma Meetings. The WGC will be an exercise in maintaining these ambitious levels. For reports see www.globalAIGS.org

For Quality of Evidence the WGC has adapted the Minckler - AAO Quality of Evidence levels:

Level I: (Interventional) Evidence obtained from at least one properly done, well-designed randomized controlled trial or meta-analyses of high quality randomized controlled trials.
(Observational) Evidence obtained from well-done population-based prevalence or incidence studies.

Level II: (Interventional) Evidence obtained from well-done non-randomized comparative trials or well-done systematic literature reviews summarizing primarily level II publications.
(Observational) Evidence obtained from high quality case-control and cohort studies.

Level III: (Interventional or Observational) Evidence obtained from non-comparative case series, case reports, and expert or consensus opinion.
• The overall level of evidence rating cannot exceed that of the individual studies reviewed. All literature assessed is assumed to be peer reviewed.

Glossary
Case-control study. An observational (non-interventional, usually retrospective) study that begins by identifying individuals with a disease (cases) for comparison to individuals without a disease (controls or reference group), in which analysis proceeds from effect to cause.

Case report. Usually a retrospective report of a single interventional or observational case experience, often with clinical-pathological correlation.

Case series. Case series include those studies describing more than one consecutive or non-consecutive cases, studied retrospectively or prospectively, usually with regard to the outcome of an intervention for its efficacy, safety, and complications. Non-comparative case series generally have no control group included but outcome may be compared to that in the literature.

Cohort study. An observational study that begins by identifying individuals with (study group) and without (control group) a factor being investigated to observe over time with regard to disease outcome; study and control groups may be concurrent or non-concurrent but must be derived from the same well defined cohort; almost always prospective with regard to data collection. Almost always longitudinal in that a particular group of patients is followed forward from a point in time. May or may not be population-based.

Comparative study. A study including two or more defined groups, compared to eachother, to make a
Cross-sectional study. An observational study that identifies individuals with and without the condition or exposure being studied at the same time (synonymous with prevalence study). May or may not be population-based.

Interventional study. A study that includes an attempt to alter the course of disease by medical or surgical or other therapy.

Observational study. A study without intervention or attempt to alter the natural course of disease or physical condition.

Audio Visual Support – Speaker Ready Room
The Speaker Ready Room will be open July 6: 8 a.m. – 6 p.m., Thursday July 7 and Friday July 8: 7.00 a.m. – 6 p.m. and Saturday July 9: 8 a.m. – 5.00 p.m.
Equipment to enable a final check to be made for your presentation is available in the Speaker Ready Room.

Power Point presentations: we strongly advise you to bring your presentation to the Speaker Ready Room AT LEAST 3 HOURS BEFORE the start of your lecture.

Please note that there are no facilities to use laptops in the session rooms.

Travel Grants
The AIGS has granted close to 40 travel grants, which include waiving of the registration fee, to glaucoma clinician scientists under forty years of age who have demonstrated a special interest in glaucoma.

Continuing Medical Education – see page III and IV

Meeting Evaluation
It is essential for assessing the quality of the WGC that participants take time to complete the evaluation forms. Every participant can have an impact on the planning for the next WGC. The AIGS has purposely created this elaborate evaluation system in order to provide the participants with an even better congress in two years. Your input is highly appreciated.

Relationship with Glaucoma Industry Members
The AIGS has deliberately chosen for a close contact with Glaucoma Industries. It is realized that Glaucoma Industry is an important force in the world of glaucoma both in research as well as in education. The AIGS aims to improve science and care of glaucoma in cooperation with its Glaucoma Industry Members. In joint committees the AIGS has established rules for the relationship with industry:

- AIGS Code of Practice
- AIGS Guidelines on Reporting and Publishing
- AIGS Guidelines of Quality and Quantity of Glaucoma Meetings

These guidelines follow the trend in specialist-industry relationship as expressed in the scientific literature, while focussing on the special aspects related to the AIGS organization

Industry Involvement
Excerpt from Global AIGS Guidelines on Quality and Quantity of Glaucoma Meetings:
1. The AIGS encourages appropriate interactions between glaucoma specialists and glaucoma industry. It encourages partnership with glaucoma industry in conducting meetings of the highest scientific quality while fostering quality professional relationships.
2. All presentations on new industry scientific findings should be within the official scientific program of the meeting and as such reviewed by the scientific program committee.
3. Proposals for lectures or a group of lectures made by industry will be treated as any other proposal to the scientific program committee. Such proposals should be purely scientific and balanced, i.e. not promotional. The opportunity to propose topic and speaker does not imply a right to have them on the program. There will be competition with other proposals for the program. They will not be called industry sponsored symposia.
4. It was also agreed that industry opportunities for scientific presentations would be either within the official scientific program and under the full responsibility of the scientific program committee as mentioned above, or outside the scientific program and under the responsibility of industry. Other options are not recommended. The audience may place a higher value on presentations scientifically scrutinized than presentations with a commercially sponsored flavor. Even when so-called sponsored symposia are organized under industry responsibility, such symposia should still have a high quality level, as neither the Program Committee nor the individual sponsor will benefit from mediocre, clearly promotional symposia. Regarding sponsored symposia, parties agreed that competing events should be avoided for the major symposia. For organizational reasons industry sponsored symposia may be scheduled in concert with the Program Committee.
5. Appropriate scientific agenda scheduling will be part of the task of the program committee.
6. A checklist for essential requirements for abstracts will be used (see addendum).
7. Rejection of abstracts will be based on the list of ‘Reasons for Rejection’. See addendum.
SOCIAL PROGRAM
The Social Program has been the subject of extensive deliberation. On the one hand it is vital to bring participants together outside the scientific sessions, to show participants the greatness of Austrian culture, to create an amiable ambiance for networking and to create an unforgettable extra-scientific, memory of the WGC in Vienna.
On the other hand the AIGS desires to spend the vast majority of its funds and devote most of its time and energy on scientific and educational matters. A deliberate choice was made for a classical reception and a banquet, one free evening and **one unbelievably memorable evening:** The Imperial Viennese Glaucoma Ball, a splendid mixture of dining, culture and dancing: the most typical extra-scientific Viennese celebration.

**Wednesday evening (July 6), 7.00-9.00 PM**

**Opening Reception by the Mayor in the Rathaus (City Hall), Rathausplatz 1**
The Rathaus is one of the most splendid of the numerous monumental buildings on Vienna’s Ringstrasse. Designed by Friedrich Schmidt (1825-1891), it was erected between 1972 and 1883. Visitors are stunned by the magnificent appointments of the state rooms, which frequently provide the atmospheric backdrop to events such as receptions, concerts and balls. This reception is a must if you want to witness the splendour of nineteenth-century Vienna (Franz Joseph and Sisi). Included in the registration fee of participants and accompanying persons. Supported by an unrestricted educational grant from Alcon and Pfizer.

**Friday evening (July 8), 7.30 PM -1.00 AM**

**The Imperial Viennese Glaucoma Ball**
The Imperial Viennese Glaucoma Ball will be held at the Imperial Palace ‘Hofburg’ in Vienna. Every country, every city has its own traditions. ‘When in Vienna, do as the Viennese do’. Well, the Viennese have a ball. An old and very popular tradition. And a real ball it will be, with the glory of the past on the one hand and modern excitement on the other hand. The highlight of the Imperial Viennese Ball is always the Waltz: music and dance. The Waltz that has kept the Viennese in training for almost two centuries. The Waltz that is linked with the name of Johan Strauss and many other composers. However, the Imperial Viennese Glaucoma Ball will have much more than that: dining with delicacies from many regions of the world. There will be sixteen larger and smaller sumptuously decorated halls which will be transformed into ballrooms, theatres, restaurants, etc. They will be used for an unsurpassed mixture of music, ballet, dancing (Waltz, Salsa, Jazz, DJ), restaurants, artists, acrobats and much more.

The preliminary and highly exciting program of the Imperial Viennese Glaucoma Ball:
- Entrée into the Imperial Palace with reception in the Celebration Hall and various other rooms; music by Strauss Trio
- Pre-opening with classical and modern ballet
- Opening by the President of the AIGS
- Post-opening: the typical Viennese Waltzing Ceremony
- Dining and dancing
- Historical and contemporary fashion show including modelling by professors of glaucoma
- Latin American percussion demonstration
- Samba extravaganza
- Firedancers from Australia
• **Grand Finale** with opera and operetta fragments ending in an extravagant surprise

In the olden days of Vienna congresses and balls were inseparable. The Imperial Viennese Glaucoma Ball is the vibrant nucleus of the extra-scientific program of the WGC. A one-time event. A must for every participant. There will be something to enjoy – if not everything – for every taste.

The **Hofburg Palace** complex was constructed between the thirteenth and twentieth centuries. Seven centuries of constant building activity have shaped its architecture. The various wings portray the architecture of the Gothic, Renaissance and Baroque periods up to the Classicism. Until 1918, the Hofburg Palace was the seat of the Habsburg dynasty and during that time almost all the various regents either restored, expanded or redesigned the palace for their own use. This magnificent building has hosted many historical meetings, such as the Congress of Vienna in 1814-1815, which established the new European order after the victory over Napoleon I, and the signing of the Salt II Agreement by US President Carter and USSR President Breshnjev in 1979.

**Evening Dress Rental**
Lambert Hofer Kostüme, Simmeringer Hauptstrasse 28, A-1110 Wien. Tel. (1) 740 90
Saturday (July 9), 7.00 – 9.00 PM

The Farewell Party in the Albertina Museum, Albertinaplatz 1
This is perhaps the most beautiful farewell from Vienna that anyone can imagine. The Albertina museum hosts one of the largest and most valuable collections of graphic art in the world. Currently the collection consists of approximately 65,000 drawings and nearly one million prints covering all of the major art-historical epochs from the late Gothic to the contemporary Modern.

The range of exemplary works stretches from Raffaello Santi, Michelangelo Buonarroti, Leonardo da Vinci, Albrecht Dürer, Rembrandt van Rijn, Peter Paul Rubens and Claude Lorrain to Eugène Delacroix, Édouard Manet and Paul Cézanne. In the twentieth century, the Albertina boasts extensive inventories of works by Egon Schiele, Gustav Klimt and Oskar Kokoschka through Pablo Picasso up to Robert Rauschenberg and Anselm Kiefer.

Duke Albert of Saxon Teschen (1738-1822) – founder of the collection and the palace’s eponym – established the basis of the Albertina’s current holdings together with his wife Marie Christine, a daughter of Maria Theresa, in the course of fifty years of activity as a collector. The enlargement of the palace to its present dimensions was carried out by Archduke Carl, victor in the great battle against Napoleon at Aspern. Following Albert’s death, the collection was expanded by his successors. With the collapse of the Habsburg monarchy it passed into the possession of the newly established republic. In 1920 it was united with the print collection of the former Imperial Court Library, and since 1921 it has carried its current name: Albertina. The collection is continually growing through new acquisitions, whereby emphasis is put on the purchase of highlights of international contemporary art. The museum was recently restored in its magnificent glory. From the balcony one has a gorgeous view over the historical buildings neighbouring the Albertina. On a warm July evening with the reddish colors of the sunset this will be an unforgettable experience. Participants will be able to visit the rooms of the museum during the Banquet. Drinks and food will be provided.

Supported by an unrestricted educational grant from Pfizer and Alcon
Accompanying Persons Program

**Thursday, July 7, 2005, 2 p.m. Duration: approx. 3.5 hours**

**Historical Vienna with tour through Schönbrunn Palace**

To provide you with a first impression of the city, we start our tour at the Ringstrasse. This boulevard, with an approximate length of four kilometers, was created in the course of the city’s first expansion in the middle of the nineteenth century on the area of the former Glacis. We will see buildings like the Museum of Fine Arts, the Natural History Museum, the City Hall, the Burgtheater, the Parliament, the University, and many more. The highlight of our excursion is a tour through Schönbrunn Palace, the summer residence of the former Imperial House of Austria.

**Friday, July 8, 2005, 8 a.m. Duration: approx. 9 hours**

**Romantic Danube Valley – ‘Wachau’**

We start our tour per bus to Wachau, the romantic Danube valley situated outside Vienna. Our first destination is Melk, where we visit the magnificent Baroque monastery and admire the breathtaking view of the Danube. After lunch we go on a boat trip on the Danube, which takes us from Melk to Spitz. Past the picturesque town of Dürnstein with its Kuenringer castle, where 800 years ago King Richard I Lionheart was held prisoner, we continue by bus to Krems. In Krems, in the course of a short walk, you will have the opportunity to take a look at the medieval town center with numerous churches adorned with frescos by the Baroque painter ‘Kremser Schmidt’. After that, we will return to Vienna.

Registration for the Social Program see page 74
TABBLAD ADVERTENTIE PFIZER
Hier komt nog de plattegrond van de exhibition
An extensive exhibition of pharmaceutical, technical and research products, equipment, books, journals, services, etc. is organized in conjunction with the World Glaucoma Congress. The scientific program will allow participants ample time to visit the exhibits.

Opening hours
The exhibition area in Foyer A will be open at the following hours:
Wednesday, July 6 11.00 a.m. – 6.00 p.m.
Thursday, July 7 9.30 a.m. – 6.00 p.m.
Friday, July 8 9.30 a.m. – 6.15 p.m.
Saturday, July 9 9.30 a.m. – 5.00 p.m.

List of exhibitors (in alphabetical order)

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Company profiles (in alphabetical order)

**Alcon Laboratories, Inc.**

Alcon Laboratories, Inc. develops, manufactures and markets ophthalmic pharmaceuticals, ophthalmic surgical equipment and devices, contact lens care products and other consumer eye care products that treat diseases and conditions of the eye. Our broad range of products represents the strongest portfolio in the ophthalmic industry, and we have leading market share positions across most major product categories.

With sales in 2004 of $3.9 billion dollars, Alcon’s mission is clear: to discover, develop, produce and market innovative, high quality eye care products that preserve, restore and enhance sight. Alcon will accomplish this by partnering with eye care professionals around the world to advance the treatment of eye disease and help people experience the best vision possible. At Alcon, we are dedicated to fostering new innovation for eye care, as well as converting new discoveries into commercially viable products. Alcon will invest in excess of $2.5 billion in research and development over the next five years, more than any other ophthalmology company.

**Allergan**

Allergan, Inc., with headquarters in Irvine, California, is a global specialty pharmaceutical company that develops and commercializes products for eye care, neuromodulator, skin care and other specialty markets. In addition to our discovery-to-development research programs, Allergan has global marketing and sales capabilities in over 100 countries that deliver value to our customers, satisfy unmet medical needs and improve peoples’ lives. Our mission is to become the partner of choice for ever better health care through the value of our technological innovation, industry leadership, partnering skills and relationships, worldwide infrastructure, research and manufacturing capabilities.

The products developed and marketed by Allergan for the treatment of glaucoma are Alphagan® (Alpha-2 selective agonist) and Lumigan® (Prostagamide). All information will be available at the booth.

**Advanced Medical Optics (AMO®)**

Advanced Medical Optics (AMO®) is a global medical device leader, focused on discovery and delivery of
innovative vision technologies that optimize quality of life for people of all ages. Products in the ophthalmic surgical portfolio include intraocular lenses, phacoemulsification systems, ophthalmic viscosurgical devices (OVDs), glaucoma implants, microkeratomes and related products used in cataract, refractive and glaucoma surgery. AMO owns or has rights to such ophthalmic surgical brands as ReZoom™, PhacoFlex®, ClariFlex®, Array®, Sensar®, CeeOn®, TECNIS®, and Verisyse® intraocular lenses, Sovereign® and Sovereign® Compact™ phacoemulsification systems with WhiteStar™ technology, AMADEUS™ and AMADEUS™ II microkeratomes, Healon® and Vitrax® OVDs, and the Baerveldt® Glaucoma Implant.

Products in the contact lens care line include disinfecting solutions, daily cleaners, enzymatic cleaners and lens rewetting drops. Among the contact lens care related product brands the company possesses COMPLETE® Moisture PLUS™, Complete® Blink-n-Clean®, Consept® F, Consept® 1 Step, Oxysept® 1 Step, Ultracare®, Ultrazyme®, Total Care®, and blink™ branded products. Amadeus is a licensed product and trademark of SIS, Ltd. OptiEdge is a registered trademark of Ocular Sciences. AMO is based in Santa Ana, California, employs approximately 3,000 people, has operations in about 20 countries, and markets products in approximately 60 countries around the world.

For more information, visit our website: www.amo-inc.com.

AMO Germany GmbH, Rudolf-Plank-Str. 31, 76275 Ettlingen, Germany.
Tel: +49-7243-729-0.

Carl Zeiss Meditec AG

Carl Zeiss Meditec AG is one of the world’s leading eye care solutions providers. The company has its own subsidiaries in USA and Japan, the world’s most important markets. In all other countries Carl Zeiss Meditec can avail itself of the worldwide distribution channels of the Carl Zeiss Group: with about 40 distributors and more than 100 agencies we operate in all four corners of the globe.

Structure and function products by Carl Zeiss Meditec provide solutions to assist throughout all stages of glaucoma.

You will benefit from fast, reliable measurements and powerful normative databases:

- Diagnosis of structural changes in the RNFL with the GDx VCC™,
- real-time cross-sectional images of the optic nerve head and RNFL thickness with the STRATUSOCT™,
- 3D imaging of optic nerve head with FF 450plus and VISUPAC as well as the instruments of our VISUCAM family,
- functional measurement of visual fields with the HFA II-i,
- efficient and effective detection of visual field loss with FDT (Frequency Doubling Technology),
- fast and accurate perimeter screening, glaucoma management and visual field testing up to 30° with Humphrey® Matrixfast and accurate perimetry screening, glaucoma management and visual field testing up to 30° with Humphrey® Matrix,
- precise and gentle treatment with VISULAS YAGIII Combi.

Carl Zeiss Meditec AG, Goeschwitzer Strasse 51-52, 07745 Jena, Germany. Phone: +49-36 41-220-333; Fax +49-36 41-220-282; e-mail: info@meditec.zeiss.com website: www.meditec.zeiss.com

Carl Zeiss Meditec Inc., 5160 Hacienda Drive, Dublin, CA 94658, U.S.A. Phone: +1 925 557 4100; Fax +1 925 557 4101; e-mail: info@meditec.zeiss.com website: www.meditec.zeiss.com

ESCRS EuroTimes

EuroTimes is the monthly news magazine for ophthalmologists published by the European Society of Cataract and Refractive Surgeons. EuroTimes is read by over 24,000 ophthalmologist in over 150 countries worldwide. It is the leading ophthalmic magazine published outside the United States. Our readers practice in a wide range of sub-specialities including glaucoma, cornea, retina and macular disease.

Haag-Streit

Haag-Streit provides a range of devices for diagnosis and treatment of glaucoma. Naturally our world-renowned slit lamp range was designed very much with glaucoma diagnosis in mind. The Goldmann applanation tonometer, set the standard for accurate reproducible measurement of intraocular pressure as one of the key parameters in Glaucoma diagnosis and treatment assessment. Central corneal thickness (CCT) is an increasingly important parameter, for glaucoma diagnosis as well as for refractive surgery, and our OLCR-Pachymeter allows fast, non-contact measurement of the CCT in unmatched precision. The OCTOPUS perimeter family, now also featuring true Goldmann kinetic perimetry, offers you the ultimate tool for early diagnosis and tracking of visual field loss. Practically all significant innovations in the field of
perimetry have been pioneered by Haag-Streit in the form of new models of the OCTOPUS perimeters with improved performance, or as add-ons or up-dates to existing equipment. Supplementary to this we have a full range of contact glasses for diagnosis and laser treatment. Haag-Streit: your partner for glaucoma diagnosis.

Contact Information: HAAG-STREIT AG, Gartenstadtstrasse 10, CH-3098 Koeniz, Switzerland. Phone: +41 31 978 01 11; Fax: +41 31 978 02 82; E-mail: info@haag-streit.ch
Website: http://www.haag-streit.com

Heidelberg Engineering GmbH
Heidelberg Engineering GmbH, Germany shows State of the Art digital diagnostic solutions. The Heidelberg Retina Tomograph (HRT II) is a multi diagnoses platform. Developed for Glaucoma today it is the Gold Standard for early detection and objective ONH structure progression. The optional Retina Module makes the HRT II a must for every practice. The latest module for Corneal Tomography converts the HRT II to a laser-scanning microscope. It opens a new world of Cornea and Limbus in-vivo histology. Our pocket pachymeter (165 g) IOPac advanced for easy pachymetry including IOP corrections should be your choice.
The Heidelberg Retina Angiograph (HRA 2) based on confocal laser scanning technology offers unprec- edented Fundus imaging by dynamic Fluorescein or ICG Angiographies or both simultaneously. Together with the excellent Autofluorescenc images it is the choice of professionals.
Heidelberg Engineering GmbHG, Gerhart-Hauptmann-Str.30, 69221 Dossenheim, Germany. Tel: +49 (0)6221-.64630; Fax: +49 (0)6221-646362; E-mail: info@heidelbergengineering.com
Website: www.heidelbergengineering.de

Kowa Europe GmbH
Nonmyd 7- Nonmydriatic fundus camera USB output, Nikon D-100 6Mpixel Digital Camera.
AP-5000C - Automatic Perimeter (Perimeter on Fundus image).
Website: http://kowa-europe.com

Laserex
Laserex has been a world leader in the development of innovative ophthalmic laser solutions for more than 15 years and continually strives to develop revolutionary treatment solutions which preserve vision and improve patient care. Innovation is the key driving force at Laserex, as demonstrated by our strong technology platform and leading integrated laser + slit lamp design. Our extensive range includes Nd:YAG laser photodisruptors for the treatment of anterior eye diseases, such as posterior capsule opacification and closed-angle glaucoma, green laser photocoagulators for the treatment of retinal eye diseases, and SLT laser systems for the effective management of glaucoma. Laserex is passionate about the treatment of glaucoma and is committed to providing ophthalmologists with innovative treatment solutions in the management of this degenerative disease – one of the leading causes of blindness today. We have played a major role in the development of Selective Laser Trabeculoplasty (SLT), a gentle but effective laser alternative which lowers intraocular pressure (IOP) by an average of 25% in 75–85% of patients treated. We are the only manufacturer of the SLT/YAG combination laser system, and have recently introduced the world’s only fully integrated SLT-dedicated laser system.

Medtronic – Advancing Ophthalmology
Medtronic delivers differentiated diagnostic and surgical solutions for all specialties with an emphasis on glaucoma. The Tono-Pen® XL provides accurate, portable IOP measurement and the Model 30™ Classic Pneumatonometer is very effective in serial tonometry. Endoscopic Laser technologies provide surgical treatment of the ciliary processes under direct visualization, which is particularly useful for the management of glaucoma in cataract patients. Complementary devices include Wet-Field® diathermy products, Accu-Temp® cauteries, Merocel®, fluid control devices, and Ocutek™ specialty instruments.

Medtronic Ophthalmics, 6743 Southpoint Drive N, Jacksonville, FL 32216, USA.
In US: Tel. 1 800 535 4646; Outside US: Tel. 1 904 332 8864.
Website: www.medtronicophthalmics.com

Merck Sharp & Dohme
Merck Sharp & Dohme is a global research-driven pharmaceutical company dedicated to putting patients
first. Established in 1891, MSD discovers, develops, manufactures, and markets medicines and vaccines in more than 20 therapeutic categories. The mission of Merck Sharp & Dohme is to provide society with innovative products and services that improve the quality of life. Two such products are TRUSOPT™, which was the first in a new class of topical glaucoma therapy since beta-blockers, and COSOPT™, which is already used in more than 60 million patient-months of therapy worldwide.

The company also devotes extensive efforts to increase access to medicines through far-reaching programs that not only donate MSD medicines but help deliver them to the people who need them. For example, since 1987 the MECTIZAN™ Donation Program to combat river blindness has been the largest, ongoing, medical donation program in history, donating more than 1 billion tablets, providing hope for the elimination of onchocerciasis by the end of the decade.

For over 45 years, MSD has shown a commitment to eye health research.


SLACK Incorporated, delivering the best in health care information and education worldwide, invites you to booth # 13. Get your complimentary issue of Ocular Surgery News Europe/Asia-Pacific Edition. Delivered monthly to over 30,000 ophthalmologists in 24 countries, this publication features timely reports on meetings and breaking news. Visit OSNSuperSite.com – Eye Care’s Only Daily News Source, now with more that 11,000 searchable documents online.

Oculus Optikgeräte GmbH

OCULUS was founded in Berlin in 1895. In 1947, the family-owned company moved to Wetzlar (60 kms north of Frankfurt), one of the centers of the optical and fine-mechanical industry in Germany. Today, approx. 170 persons are working in R&D, production, distribution and service of diagnostic instruments for ophthalmologists.

Within the last few years the company has changed its profile and introduced innovative versions of traditional products:

- PENTACAM: Rotating Scheimpflug camera, offering also densitometry, anterior chamber analysis, corneal topography, pachymetry. Comprehensive diagnostic tool for Glaucoma screening, corneal surgery and lens implantation.
- PACHYCAM: Non-contact slit-lamp mounted Pachymeter with integrated keratometer.
- TWINFIELD: Automatic static and kinetic full-field perimetry acc. to Goldmann. The new projection-system allows also manual kinetic perimetry, color-perimetry and a stimulus absolutely equal in shape and brightness.
- CENTERFIELD: This compact central-field screener uses the technology of the Twinfield and comes with color and kinetic perimetry and with fixation-shift for a 70°-field.
- CLIP: This exciting fast threshold strategy combines speed and reproducible precision. Available for Twinfield and Centerfield.
- EASYFIELD: This screener-sized 30 degree-perimeter, is designed for quick perimetry. Screening and threshold strategies and 30-2 grid allow full perimeter-compatibility. The hand-control-unit includes printer, storage capability for 40,000 examinations and PC-interface.

OCULUS OPTIKGERÄTE GmbH, Dutenhofen, Münchholzhäuser Strasse 29, D-35549 Wetzlar, Germany.

Contact: Harald Schick; Tel: +49-641-2005-0; Fax: +49-641-2005-295 ; E-mail:export@oculus.de

Ophthalmology Times

The Ophthalmology Times Group is comprised of Ophthalmology Times, Ophthalmology Times International, Ophthalmology Times China, Ophthalmology Times India, OphthalmologyTimes.com, and Ophthal-
Ophthalmology Times Medical Education. Published 24 times per year, Ophthalmology Times is the leading physician-reviewed news magazine in the ophthalmic market, delivering a well-rounded package of surgical and clinical news, industry trends, insights, and discoveries in all specialties.

Ophthalmology Times, 485 Route 1 South, Bldg. F, First Floor, Iselin, NJ 08830, USA. Contact Person: Lauri Jorgensen; Tel:+1-732-346-3013; Fax: +1-732-596-0003; E-mail: ljorgensen@advanstar.com Website: www.OphthalmologyTimes.com

**Optonol AG**

The Ex-PRESS™ is a miniature glaucoma implant that provides a simplified method of filtration surgery for patients with open angle glaucoma. The Ex-PRESS™ implanted under a Scleral Flap is a minimally invasive reproducible procedure that requires no iridectomy and no scleral tissue removal.

Product category: Glaucoma pressure regulators/devices

OPTONOL AG, Bundesstrasse 5, P.O.Box 1142, CH-6301, Zug, Switzerland. Tel: +41-41 727 2270; Fax: +41-41 727 2273 ; E-mail: remi@optonol.ch Website: www.optonol.com

**Pfizer**

Pfizer Ophthalmics is dedicated to preserving sight and eliminating preventable blindness through a commitment to innovation and partnerships. For example, Pfizer’s commitment to the WHO’s International Trachoma Initiative is providing 135 million treatments over the next five years. Our goal is to become the most valued partner in ophthalmics by developing breakthrough medicines, supporting healthcare professionals and their patients, and pursuing progress with an unwavering commitment to leadership and integrity.

Please visit the Pfizer exhibit to hear more about Xalatan® (latanoprost) and Xalacom® (latanoprost/timolol maleate).

Pfizer Ltd, 235 East 42nd Street, New York, NY 10017, USA. Tel: +1 212-733-2323; Website: www.pfizer.com

**Ryazan State Instrument-Making Enterprise**

Ryazan State Instrument-Making Enterprise (GRPZ) is one of the largest and dynamically developing Russian enterprises, which possesses the powerful instrumental basis and unique technologies. The enterprise is certificated according to the demands of international quality system ISO 9001. One of the main areas of activity is manufacturing of medical equipment. For ophthalmology GRPZ offers the unique «diaton» tonometer that makes it possible to carry out intraocular pressure measuring through the eyelid excluding direct contact with the eye mucous membrane.

The advantages of the device are:
- no contact with the cornea
- no anesthesia
- possibility of diagnose glaucoma at any stage
- measuring of IOP in patients after corneal surgeries
- screening examinations of the patients
- IOP measuring in the presence of chronic conjunctivitis, erosions, edema and cornea dimness
- IOP measuring during contact correction.

The unique methodology of intraocular pressure measuring through the eyelid applied in the device provides new resources in ophthalmotonometry, simplicity and safety of tests. Method for measuring the intraocular pressure through the eyelid and device for realizing the same are protected with the Patent of Russia No. 2123798, United States Patent No. US 6,394,954 B1 and Patent of Japan No. 3593314.

**Santen**

Santen is a multinational ophthalmic pharmaceutical company founded in Osaka, Japan in 1890 specializing in treatments for eye diseases, offering both prescription and OTC products. Among prescription ophthalmic pharmaceuticals, Santen holds the top share within the Japanese market and is one of the leading ophthalmic companies worldwide.
The desire to contribute to the quality of life of people not only in Japan, but also around the world, encouraged Santen to begin in developing its worldwide presence in the 1990’s. Santen has subsidiaries in the U.S., Europe and Asia and is actively pursuing technological and marketing alliances with a number of pharmaceutical companies and research institutes.

Santen, Niittyhaankatu 20, PO Box 33, FIN-33721 Tampere, Finland.
Tel: +358-3-284 8111; Fax: +358-3-318 1900; E-mail: tuomas.huuhtanen@santen.fi
Website www.santen.com

SOLX, Inc.
SOLX, Inc. is sharing its vision of a new glaucoma treatment system The DeepLight® Glaucoma Treatment System is the first of its kind to combine a Titanium Sapphire 790 nm laser with a photo-titratable gold micro-shunt to provide physicians the widest range of intraocular pressure (IOP) reduction options possible. The system is in development and limited by United States law to investigational use only. Based at the Boston University Photonics Center in Boston, Massachusetts, SOLX is a privately held company developing new approaches to glaucoma treatment. More information can be found online at www.SOLX.com.

STAAR Surgical AG
STAAR Surgical is manufacturer of the AquaFlow™ Collagen Glaucoma Drainage Device. The implant made of collagen is 4 mm in length and 0.5 mm in diameter. It is intended for patients diagnosed with open angle glaucoma and used in combination with non-penetrating deep sclerectomy under local or topical anesthesia. The AquaFlow™ maintains a sub-scleral space, preventing fibrosis and scarring. The implant is covered by a monolayer of fibronectin within 27 days of surgery and gradually resorbed over a six to nine month period. Results over eight years show that deep sclerectomy with collagen implant provides stable longterm control of IOP.
STAAR Surgical is also developing, manufacturing and globally distributing intraocular lenses for use in cataract and refractive surgery, including the Implantable Contact Lens ICL™ for myopia, hyperopia and myopia with astigmatism, and the worlds first preloaded IOL Injection System KS-3, soon to be marketed with an aspheric lens.

STAAR Surgical AG, Hauptstrasse 104, CH-2560 Nidau, Switzerland.
Phone +41 32 332 88 88; Fax +41 32 332 88 99; E-mail: info@staarag.ch
Website: www.staar.com

Talia Technology
Talia Technology, founded in 1991, develops and markets ophthalmic imaging devices for the screening, diagnosis and follow-up treatment of the most common retinal diseases and pathologies such as Glaucoma, Diabetic Retinopathy and AMD. Talia’s flagship is the RTA Talia hold its headquarters in Israel and has two fully owned subsidiaries in Germany and the US.
What is the RTA?
The RTA is an all-in one modular ophthalmic imaging system offering a wide range of diagnostic solutions. This single instrument provides retina and disc diagnostics, thickness and topography analysis, fundus imaging, 3D interactive imaging and more. The RTA can be used for screening, diagnosis and reliable follow-up of Glaucoma, DME, AMD and retinal pathologies such as macular holes.

Wisepress Online Bookshop
Wisepress Online Bookshop is pleased to present a display of publications chosen especially for WGC 2005 from the world’s leading publishing houses. All the books on display can be ordered/bought directly at the stand or via our website. We can also order you free sample copies of the journals on display and take subscription orders. Whatever your book requirements, Wisepress will be happy to help - whether you are an author seeking a publisher or having difficulty obtaining a title, our professional staff will assist you.

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E-mail: Bookshop@wisepress.co.uk Website: www.wisepress.co.uk
Contact: Nadia Ahmed, Bookshop Manager
Ziemer Ophthalmic Systems of Switzerland
A family enterprise dedicated to Ophthalmology since 35 years; providing leading edge, award-winning technologies for improved surgical outcomes and superior diagnostic results; enabling Ophthalmologists and Optometrists to deliver better vision care to their patients.
Ziemer Ophthalmic Systems is a Switzerland-based group of companies who engage in research, engineering, production, and worldwide marketing of high-tech products for the ophthalmic market. The Group serves key markets such as Glaucoma, Refractive, and Cataract, delivering leading specialty products for surgical and diagnostic applications. Products include the AMADEUS II microkeratome (manufactured by SIS Surgical Instrument Systems, a Ziemer Ophthalmic Systems Group Company, for AMO Advanced Medical Optics), the PASCAL Dynamic Contour Tonometer (manufactured by SMT Swiss Microtechnology AG, a Ziemer Ophthalmic Systems Group Company), and the SwissBlade series of steel and diamond cataract knives. Further major product introductions are planned for the current year. All products (with the exception of the AMADEUS microkeratome) are marketed by Ziemer Ophthalmic Systems AG, headquartered in Port (Switzerland), its subsidiary Ziemer Ophthalmic Systems USA (Tampa, Florida), and its worldwide network of specialized distributors.

Ziemer Ophthalmic Systems AG, Dr. Anton C. Wirthlin, CEO, CH-2562 Port, Switzerland. Phone: +41 32 332 7052; mail: anton.wirthlin@ziemer-ophthalmics.com
Ted Newill, Ziemer Ophthalmic Systems USA, 33702 Tampa, FL, USA. Phone: +1 (727) 525 2881; E-mail: Ted.Newill@ziemer-ophthalmics.com
Website: www.ziemer-ophthalmics.com

3W Informed
Our medical bookshop 3W Informed has over 15 years experience with medical books and multimedia. Nowadays, our database contains more than 1,250,000 titles. At this congress we will sell books, CD-Roms, PDA’s and journals about Glaucoma.

For more information, please visit our website www.3w-informed.com

To eat our cake and have it, to lose our sole and save it, to enjoy the physical privileges of selfishness and the moral luxury of altruism at the same time, would be the ideal. But the real offers us these terms in the shape of mutually exclusive alternatives of which only one can be true at once; so that we must choose, and in choosing murder one possibility.

William James
TABBLAD ADVERTENTIE PFIZER
KEERZIJDE TABBLAD
GENERAL MEETING INFORMATION
**Venue**

**Neue Messe Wien**
Messeplatz 1  
A-1021 Wien  
Tel: +43 (0)1 727 20-0  
Fax: +43 (0)1 727 20-443  
www.messe.at

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**Congress Organizer**

AIGS Meeting Office  
Jan van Goyenkade 11, 1075 HP  
Amsterdam,  
The Netherlands  
Tel.: +31 20 679 3411  
Fax: +31 20 673 7306  
E-mail: aigs@eurocongres.com

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**Local Organizer**

(Hotel accommodation, tours and partner program)  
Austropa Interconvention  
Austrian Travel Agency Corp.  
Friedrichstrasse 7  
A-1010 Vienna, Austria  
Tel: +43 1 588 00 – 513 and 514  
Fax: +43 1 588 00 - 520  
E-mail: aigs@interconvention.at

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**Offices**

* Association of International World Glaucoma Societies  
* International Glaucoma Review  
  Booth # 20

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**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 scientific session or social 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.

*Please note*: accompanying persons and exhibitors will not be admitted to the scientific sessions. Accompanying persons do have free access to the exhibition.

Name badges have been colour-coded as follows:

- **Red**: Faculty  
- **Blue**: Delegates  
- **Green**: Accompanying persons  
- **Yellow**: Exhibitors  
- **Purple**: Press

The charge for replacement of lost badges will be € 15.

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**Banking Service, Cash Machine, Credit Cards.**  
The official currency in Austria is the Euro. Banks are usually open from Monday to Friday 8 a.m. to 12.30 p.m. and 1.30 p.m. to 3 p.m., on Thursday until 5.30 p.m. 

A Cash Machine is located outside the entrance of Hall D of the Congress Centre. 

Most hotels, restaurants and shops accept international credit cards.

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**Business Center**  
The ‘Print Shop’ is situated in the Mall and will be open during congress hours. The Print Shop provides services like photocopying, faxing, producing business cards, the sales of pens, paper, envelopes, etc.

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**Coat and Luggage**  
A coat and luggage check area will be available in the basement under Foyer A.  
There is a charge of € 1. per item.

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**Coffee and Tea**  
Coffee and tea is available at various catering points throughout the Congress Centre.

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**Dress code**  
Meeting: casual or business casual.  
Welcome Reception: business, tenue de ville.  
Imperial Viennese Glaucoma Ball: dark suit and tie, smoking (black tie). You may also go for the official dress for Viennese balls: tails (white tie); women: elegant evening dress or long skirt will do. Traditional evening dress of your country is highly appreciated.  
Farewell Party: business, tenue de ville.

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**Electricity**  
220 V, with 50 Hz frequency

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**Evening Dress Rental**  
Lambert Hofer Kostüme, Simmeringer Hauptstrasse 28, A-1110 Wien. Tel. (1) 740 90

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**Hotel Reservations**  
For Hotel reservations please contact Austropa Interconvention at the Hotel Desk in the Registration Area in Hall A.
Map of Vienna
A pop-up Vienna City Map is included in your congress bag. This map is presented to you courtesy of Alcon Laboratories, Inc.

Insurance, Liabilities
Neither AIGS, nor the Organizers can be held responsible for any personal injury, loss, damage, accident to private property or additional expenses incurred as a result of delays or changes in air, rail, sea, road or other services, strikes, sickness, weather, acts of terrorism and any other cause. All participants are encouraged to make their own arrangements for health and travel insurance.

Internet Access
Internet Corners are available in the Registration Area and in the Congress Centre (see floorplan). Supported by an unrestricted educational grant by Pfizer.

Lunch
Lunch is available at various catering points throughout the Congress Centre at a cost. Lunch boxes will be provided by the midday Symposium organizers.

Message Desk
At the message desk delegates can leave or collect messages. The desk is located in the Registration Area.

Program Changes
Actual program changes will be indicated on the message boards located throughout the congress centre.

REGISTRATION / TICKETS
Registration desk – opening hours:
Wednesday July 6 8.00 a.m. – 6.00 p.m.
Thursday, July 7 7.00 a.m. – 6.00 p.m.
Friday, July 8 7.00 a.m. – 6.00 p.m.
Saturday, July 9 8.00 a.m. – 5.30 p.m.

On-site Registration fees
(Prices are exclusive of 20% VAT)
Participants: € 725.-*
Residents: € 250.-/**
Accompanying persons: € 200.-***

Certificate of Attendance
Certificates of Attendance will be available at the Registration Desk in the Registration Area as of Friday July 8, 14.00 hours.

The organizers cannot assume liability for any changes in the program due to external or unforeseen circumstances.

Restaurant Guide
Our Host, the Austrian Glaucoma Society, has prepared a personal Restaurant Guide under the leadership of Dr. Tony Hommer. Restaurants in Vienna offer a variety of high quality lunches and dinners. The city is one of Europe’s premier culinary centres. The Restaurant Guide will lead you to the places our local colleagues know and appreciate. The Guide is presented to your courtesy of Croma and is included in your congress bag.

Shirts, buttons, and all the additional things
Tel. (1) 533 5084
Tel. (1) 512 5911

Shopping
Shops are open on weekdays from 9 a.m. - 6 p.m. (some until 8 p.m. on Thursday or Friday); on Saturdays: 9 a.m. to 1 p.m.; larger shops and malls are open until 5 p.m. on Saturdays. Shops are closed on Sundays.

Tipping
Usually tips are included in all fees, however a tip of approximately 10% at restaurants will always be appreciated if the service was at your satisfaction.

Courses (included in registration fee)
Courses tickets are available for registration on-site on a first come first served basis. Tickets can be obtained at the Course/Meet the Expert Desk in the Registration Area in Hall A.

Meet the Expert Breakfast Table Discussions (included in registration fee)
Tickets for Meet the Expert Breakfast Tables can only be booked on-site on a first come first served basis. Tickets can be obtained at the Course/Meet the Expert Desk in the Registration Area in Hall A. Continental breakfast will be provided.

Social Program
A limited number of tickets is available on-site for the:
Imperial Viennese Glaucoma Ball (July 8): € 60,- including VAT and the Farewell Party (July 9), included in the registration fee for participants and accompanying persons. Tickets can be obtained at the Registration Desk in Hall A.

* The fee for participants and residents covers: admission to all scientific sessions, courses, meet the expert breakfast tables, congress bag, program and abstract book, and invitations to the Welcome Reception and Farewell Party.
** To qualify for the resident registration fee, the applicant’s registration form must be signed by the head of the relevant university/institute department and stamped with the university’s/institute’s official stamp.
*** The fee for accompanying persons includes: registration for one half-day tour, ‘Historical Vienna, and one full day tour, ‘Romantic Danube Valley’, a public transport ticket and invitations to the Welcome Reception and the Farewell Party.
Transportation

Getting from the City Centre to the Airport

A shuttle service from a number of fixed meeting points to the Congress Centre and vice versa is provided in the morning before the congress starts and in the afternoon after the meeting according to the following schedule.

**Departure Times: Schwedenplatz—> Messe**
- **Wednesday, July 6, 2005:** 08.00, 08.30, 09.00, 09.30, 10.00, 10.30, 11.00, 11.30, 12.00, 12.30, 13.00.
- **Thursday, July 7, 2005:** 06.45, 07.00, 08.00, 08.30.
- **Friday, July 8, 2005:** 06.45, 07.00, 08.00, 08.30.
- **Saturday, July 9, 2005:** 08.00, 08.30, 09.00.

**Departure Times: Stadtpark (Hilton)—> Messe**
- **Wednesday, July 6, 2005:** 08.00, 08.30, 09.00, 09.30, 10.00, 10.30, 11.00, 11.30, 12.00, 12.30, 13.00.
- **Thursday, July 7, 2005:** 06.45, 07.00, 08.00, 08.30.
- **Friday, July 8, 2005:** 06.45, 07.00, 08.00, 08.30.
- **Saturday, July 9, 2005:** 08.00, 08.30, 09.00.

**Departure Times: Albertina—> Messe**
- **Wednesday, July 6, 2005:** 08.00, 08.30, 09.00, 09.30, 10.00, 10.30, 11.00, 11.30, 12.00, 12.30, 13.00.
- **Thursday, July 7, 2005:** 06.45, 07.00, 08.00, 08.30.
- **Friday, July 8, 2005:** 06.45, 07.00, 08.00, 08.30.
- **Saturday, July 9, 2005:** 08.00, 08.30, 09.00.

**Departure Times: Messe—> Schwedenplatz**
- **Wednesday, July 6, 2005:** 17.45, 18.15.
- **Thursday, July 7, 2005:** 18.15, 18.45.
- **Friday, July 8, 2005:** 18.15, 18.45.
- **Saturday, July 9, 2005:** 17.45, 18.15.

**Departure Times: Messe—> Stadtpark (Hilton)**
- **Wednesday, July 6, 2005:** 17.45, 18.15.
- **Thursday, July 7, 2005:** 18.15, 18.45.
- **Friday, July 8, 2005:** 18.15, 18.45.
- **Saturday, July 9, 2005:** 17.45, 18.15.

**Departure Times: Messe—> Albertina**
- **Wednesday, July 6, 2005:** 17.45, 18.15.
- **Thursday, July 7, 2005:** 18.15, 18.45.
- **Friday, July 8, 2005:** 18.15, 18.45.
- **Saturday, July 9, 2005:** 17.45, 18.15.
Public Transport Vienna boasts a modern, efficient public transport system consisting of tramways, underground railway (U-Bahn) and buses. Almost all hotels have easy access to the public transportation system. Tickets are sold at dispensers, ticket counters at major subway stations and in tobacco kiosks (TABAK). A weekly ticket, valid on all train, bus, tram and subway lines within Vienna, costs € 12.50; a single-ride ticket € 1.50

To travel to the Neue Messe Vienna:
- take the underground line U1, Praterstern stop, and then the tram 21, direction Praterkai, Messeplatz stop or
- the underground line U1, Vorgartenstrasse stop, and then the bus 11a, Elderschplatz stop

Weekly tickets can also be ordered at the Social Desk.

Tours
* Tours included in the registration fee for accompanying persons
Accompanying persons will find a ticket for these tours in their registration package.
* Optional tours
To book optional tours please contact Austropa at their Desk in the Registration Area.

Vienna

The Inner City
Rising from Vienna’s old city centre, just beyond where the stone walls of the Roman camp once stood, the predominantly Gothic Stephansdom (St. Stephan’s Cathedral) continues to tower over the hearts and minds of the Viennese as it has for some 800 years. Known affectionately as Der alte Steffl (Old Steve) by the Viennese, it blends the styles of many ages into a unique and harmonious whole. Its colourful tiled roof depicts the two-headed Habsburg eagle bearing the imperial crown and the order of the Golden Fleece. See for more extensive information www.info.wien.at.

Radiating away from the Stephansdom are a number of little streets as intricately connected as the threads of a spider’s web. And within the web, more churches, museums, palaces, boutiques, galleries, antique shops, coffeehouses, sidewalk cafes, and restaurants await the visitor. It doesn’t really matter which direction you choose to walk when wandering about. The old Inner City holds endless delights.

The Ring
Encircling the Inner City is a broad boulevard, called the Ring. It replaced the city fortifications that were torn down in the mid-nineteenth century by order of Franz Joseph I, the Habsburg emperor who ruled from 1848 to 1916.

Amongst the treasures lining the Ring is the State Opera House. For many Viennese, the soul of Vienna resides within its elegant interior. The opera in Vienna is reasonably egalitarian. There’s a ticket price to fit everyone’s pocket, because the Viennese love of music is not class-bound. What matters to the Viennese is the quality of the performance.

There are innumerable museums in Vienna. But the greatest of them all is the Kunsthistorisches Museum (the Museum of Fine Arts), located further down the Ring. Its massive collections include a wealth of art by Rembrandt, Raphael, Bosch, Titian, Rubens, and Vermeer, as well as the largest collection of Pieter Bruegel in the world. And competing with the richness of its art, the intricately designed marble halls of the museum are quite breathtaking.

Facing the Kunsthistorisches Museum is the Naturhistorisches Museum (Natural History Museum), chock-full of curiosities. Its collections were started by Maria Theresia’s husband, Franz Stephan von Lothringen, and enlarged by their successors. Dinosaur skeletons, stuffed mammals, birds, and fish, minerals, one of the oldest prehistoric sculptures in the world, the Venus of Willendorf, and unique painted skulls from Hallstatt graves, are amongst its treasures.

Between the two museums is the commanding memorial to the eighteenth-century Habsburg ruler Maria Theresia, who sits high on her throne surrounded by her ministers and generals. In addition to being the only
female ruler (and one of the most successful) in the history of the House of Habsburg, Maria Theresia bore sixteen children. Across the street, the spacious grounds of Heldenplatz lead to the Hofburg, formerly the imperial palace. Today, this magnificent open space reveals many of the splendid public buildings and gardens lining the Ring and contributes to the overall beauty of this boulevard, enhanced in spring by its many flowering lilac bushes.

The Viennese Imperial Ball will be held in the Hofburg (see front cover)

The mixture of styles along the Ring blends into a surprisingly harmonious study of European architectural history, ranging from the neo-Grecian style Parliament to the neo-Gothic Rathaus (city hall), the neo-Renaissance Burg Theater to the neo-Baroque Imperial Palace, enhanced by the elegance of the formal gardens of the Burggarten and the Volksgarten.

The opening ceremony is taking place in the Rathaus

The Hofburg, just inside the Inner Ring, was started in 1279 and eventually became the imperial residence of the Habsburgs. Franz Joseph I, a resident for 86 years, slept on a spartan iron bedstead in his luxuriously appointed apartment as did his wife, the very elegant and beautiful Empress Elizabeth, affectionately known as Sisi by the Viennese.

Franz Joseph ruled for 68 years. Accompanying his spartan tastes in comfort was an equally spartan attitude towards food. The etiquette of the day dictated that courses end once the emperor had finished eating. At large banquets, many guests had hardly been served their first course by the time Franz Joseph had finished his last. A tradition arose for guests to retire to the nearby Hotel Sacher for dinner, after ‘dinner’. The Hotel Sacher still serves the world famous Sachertorte (a chocolate cake layered with apricot jam) created there.

Sisi herself was quite ahead of her time in staying fit. Each morning at 5 a.m. she bathed in cold water in a copper bathtub. She was an excellent horsewoman and designed and followed her own personal fitness training regime which included gymnastics on a wooden ladder and rings, which are on display in her former rooms. She retained her remarkably small waist throughout her life which was ended by an assassin’s file.

The Hofburg also houses the Schatzkammer (Imperial Treasury) containing an abundance of treasures from the past. The thousand year old bejeweled crown of the Holy Roman Empire is on display here, as well as other imperial insignia. Truly astonishing are the relics on display in the Ecclesiastical Treasury. Amongst its treasures is the Holy Lance, which is reputed to have pierced the side of the Lord and thus bathed in His blood. There are several thorns from Christ’s Crown of Thorns, particles of the True Cross, one of which has a nail hole thought to have soaked up His blood, hairs from His beard, droplets of His blood, a piece of His shroud, and the nail that pinned Christ’s right hand to the Cross. St. Stephan’s purse is said to have contained his blood, another reliquary contains one of St. Peter’s molars, another a fragment of the Virgin Mary’s veil. All together, the Schatzkammer is one of the finest treasuries in Europe.

Next to the Treasury is the Burgkapelle (the Imperial Chapel), where the Wiener Sängerknaben (Vienna Boys Choir) sing during Sunday morning mass. The origin of the Vienna Boys Choir goes back to the fifteenth century. Today, 150 boys receive music training and general instruction in the Augarten Palace. The boys form several choirs and they perform all over the world.

Outside the Ring

Now it’s time to venture a bit farther outside the Ring to visit the Upper and Lower Belvedere Palaces, and the gardens in between. Eugene of Savoy was a French prince, who served the Habsburgs and defeated both the French and the Turks in the seventeenth century. Initially, he had offered his services to his own king, but was turned down because he was too short. But in spite of his diminutive size, Prince Eugene saved the day for the Habsburgs several times and was richly rewarded. He used his proceeds well, building these fabulous palaces and collecting art and furnishings to fill them.
But your sightseeing pleasures aren't over yet. The very Baroque Schönbrunn Palace was the summer residence of the Habsburgs. Although Baroque on the outside, the style inside is mostly Rococo. Maria Theresia, who ruled for forty years in the eighteenth century, provided the funds for the Rococo finishing touches. Schönbrunn is a grand palace, designed with Versailles in mind. Wolfgang Amadeus Mozart entertained Maria Theresia and her family and guests here at the age of six. Legend has it that Mozart declared his love for Princess Marie Antoinette, Maria Theresia's daughter, who was seven years old at the time.

Like the Belvedere, the Schönbrunn palace is a must-see site. Forty-five of the 1,141 rooms in the palace are open to the public. The court architect and designer, Johann Fischer von Erlach, included 139 kitchens in his plans, but not even the emperor had a private bathroom.

But don't limit yourself to just a walk around the inside of the palace, the extensive gardens outside are exceptional. They were laid out in the formal eighteenth-century French manner. High on the hill in front of you as you leave the palace, stands the delightful Gloriette. Originally, the palace itself was to be built there, but, unfortunately, the high costs involved caused a change of plans.
TABBLAD ADVERTENTIE PFIZER
That blessed mood
In which the burthen of the mystery,
In which the heavy and the weary weight
Of all this intelligible world,
Is lightened: that serene and blessed mood
In which the affections gently lead us on,
- Until, the breath of this corporeal frame
And even the motion of our human blood
Almost suspended, we are laid asleep
In body, and become a living soul:
While, with an eye made quiet by the power
Of harmony, and the deep power of joy,
We see into the life of things

Wordsworth
The AIGS is an independent, impartial, ethical, global organization for glaucoma science and care.

Mission
To optimize the quality of glaucoma science and care through communication and cooperation among international Glaucoma Societies, with Glaucoma Industries, Glaucoma Patient Organizations and all others in the glaucoma community.

Vision
Curiosity, creativity, quality and integrity are essential ingredients for science and care.

The AIGS is the first global subspeciality effort involving all stakeholders: ophthalmologists, other eye specialists, industrialists and patients.

Goals
Unite, communicate, meet, create personal contact, support, inform, guide, educate, investigate, aim for quality.

Glaucoma Societies
We present here only the names of the Glaucoma Societies. For further information the reader is referred to:
1. The Glaucoma Society Posters (see below).
2. The Global AIGS Glaucoma Society Directory (see below).

A. Member Regional Glaucoma Societies

American Glaucoma Society - AGS
Australia and New Zealand Glaucoma Club - ANZGC
Asia Oceanic Glaucoma Society - AOGS
Canadian Glaucoma Society - CanGS
Chinese Glaucoma Society - ChinGS
European Glaucoma Society - EGS
Glaucoma Society of India - GSI
Glaucoma Society of the International Congress of Ophthalmology - GSICO
International Society of Glaucoma Surgery - ISGS
Japanese Glaucoma Society - JGS
Latin America Glaucoma Society - LAGS
Optometric Glaucoma Society - OGS
Pan Arab African Glaucoma Society - PAAGS
Pan American Glaucoma Society - PAGS
South African Glaucoma Society - SAGS
South East Asia Glaucoma Interest Group - SEAGIG

B. National Glaucoma Societies

Argentinean Glaucoma Society
Austrian Glaucoma Society
Azerbaijani Glaucoma Society
Belgian Glaucoma Society
Brazilian Glaucoma Society
Bulgarian Glaucoma Society
Central American Glaucoma Society
Chilean Glaucoma Society
Colombian Glaucoma Society
Croatian Glaucoma Society
Czech Glaucoma Society
Danish Glaucoma Society
Egyptian Glaucoma Society
Finnish Glaucoma Society
French Glaucoma Society
German Glaucoma Society
Ghana Glaucoma Association
Glaucoma Society UK and Ireland
Greek Glaucoma Society
Hungarian Glaucoma Society
Iceland Glaucoma Section of the IOS
Indonesian Glaucoma Society
Israeli Glaucoma Society
Italian Glaucoma Society
Korean Glaucoma Society
Lesotho Glaucoma Society
Lithuanian Glaucoma Society
Mexican Glaucoma Society
Netherlands Glaucoma Group
Nigerian Glaucoma Society
Norwegian Glaucoma Society
Philippine Glaucoma Society
Polish Glaucoma Society
Portuguese Glaucoma Society
Rumanian Glaucoma Society
Russian Glaucoma Society
Serbia & Montenegro Glaucoma Society
Slovenian Glaucoma Society
Spanish Glaucoma Society
Swedish Glaucoma Society
Swiss Glaucoma Society
Taiwanese Glaucoma Society
Thai Glaucoma Society
Turkish Glaucoma Society
Ukrainian Glaucoma Society
Zimbabwean Glaucoma Society

* Some Societies may call themselves sections of the national general ophthalmological society.
Posters Glaucoma Societies
As this is the first time ever that all Glaucoma Societies of the world convene, the AIGS has asked each Glaucoma Society to present information on its structure on a Glaucoma Society Poster. These Glaucoma Society Structure posters can be visited in the Mall of the Conference Center and will be on from Wednesday July 6, noon till Saturday July 9, 5.00 PM.

Global AIGS Directory of Glaucoma Societies
The AIGS has identified 62 Glaucoma Societies and has compiled a Global AIGS Directory of Glaucoma Societies which includes basic information on the Glaucoma Society as far as available by June 1, 2005. This directory has been made available to the representatives of the Glaucoma Societies and to the AIGS Glaucoma Industry Members during the Inaugural Assembly Meeting. The Directory includes information on:
- Society Name (if regional society list partner societies and groups)
- Officers (+ Contact information)
- Administrator
- Headquarters Address
- Contact Information

The Directory can be obtained on request through the AIGS representative in the AIGS booth.

Glaucoma Industry Members of the AIGS

Glaucoma Industry Members
Alcon
Allergan
MSD
Novartis
Pfizer

Associate Glaucoma Industry Members
AMO
Carl Zeiss Meditec
Heidelberg Engineering
Haag Streit
Oculus Optikgeräte

Supporting Glaucoma Industry Members
Laserex/Ellex
Medtronic
Santen Japan
Senju
Ziemer Ophthalmic Systems

Global Glaucoma Patient Organization
At the initiative of the AIGS, a Global Glaucoma Patient Organization was founded in October 2004, New Orleans, LA, US. The aim of the organization is a further cooperation between national and regional Glaucoma Patient Organizations. Contacts between the GGPO and the AIGS are formalized through the AIGS GPO Liaison Committee. This committee will meet during the World Glaucoma Congress in Vienna.

Goals of the AIGS
- To further develop an effective world-wide organisation to realise common goals and improve standards for glaucoma management and research
- To facilitate and coordinate communication and collaboration between Glaucoma Societies, Glaucoma Industries and Glaucoma Patient Organizations and other organizations in the field
- To maintain and update an AIGS Global Code of Practice
- To maintain and update global guidelines for glaucoma diagnosis and treatment
- To maintain and update global guidelines on publication and reporting on glaucoma treatment
- To maintain and update global guidelines for the conduct of Glaucoma Meetings
- To present, classify and review information on glaucoma through International Glaucoma Review
- To improve the awareness of glaucoma
- To publish and update a Directory of Glaucoma Societies
- To stimulate and support Glaucoma Societies
- To create a forum for exchange on global glaucoma research, screening, prevention of Glaucoma Blindness and WHO relationships
- To organize global Consensus Meetings
- To organize Information and Planning Exchange Meetings
- To organize the Word Glaucoma Congress for all members of the AIGS

History
The AIGS officially started its activity on January 1, 2002 after extensive preparations in 2001. The first intercontinental cooperation started in the early nineties, when the American Glaucoma Society and the Japanese Glaucoma Society joined the European Glaucoma Society as supporters of IGR and organized combined meetings. In 2001 R.N. Weinreb and E.L. Greve developed the idea to create a global Association of Glaucoma Societies, starting with the then thirteen Glaucoma Societies involved in IGR. Roger Hitchings joined immediately and this triumvirate started to realize a dream. An essential aspect of the dream was to include everyone involved in glaucoma: Glaucoma Societies and Glaucoma Industries and Glaucoma Patient Organizations. The first Board of Governors consisted of R.A. Hitchings, R.N. Weinreb, E.L. Greve, Y. Kitazawa and R. Susanna. The first President was Roger Hitchings; Robert Weinreb became President Elect and Erik Greve who had just retired from University and had sufficient time and motivation for this huge job became the Executive Vice President. In the four and a half years of its existence the AIGS achieved the following:
AIGS achievements 2002-2003
- Global organization, network
- Global communication, IGR
- Cooperation with Glaucoma Industries
- Global Quality Standards
  - Code of Practice
  - Guidelines on Reporting and Publishing
  - Guidelines on Quality for Glaucoma Meetings
  - Guidelines on Glaucoma Society Organization
  - Information and Planning Exchange Meetings
  - Consensus Meeting on ‘Structure and Function in the Management of Glaucoma’

AIGS achievements 2004
- Guidelines Reporting and Publishing now available online; evaluation in AIGS and other meetings.
- Guidelines on Quality of Glaucoma Meetings now available online; evaluation in AIGS and other meetings.
- Criteria for Glaucoma Society Organization now available online
- Global Guidelines on Diagnosis and Treatment in statu nascendi
- Report on Screening for Primary Open Angle Glaucoma started
- First Global AIGS Conference with representatives of Glaucoma Patient Organizations completed
- Final Announcement and call for papers AIGS World Glaucoma Congress 2005 out
- Six new Glaucoma Industry Members
- Book on first Global AIGS Consensus Meeting on Structure and Function published
- Preparations on second Global AIGS Consensus Meeting on Surgical Treatment of Open Angle Glaucoma

Achievements AIGS 2005
- Organization of second Consensus Meeting on Surgical Treatment of Open Angle Glaucoma
- World Glaucoma Congress

The AIGS considers the organization of the World Glaucoma Congress every two years as one of its priorities.

AIGS Committees
Executive Committee: R.N. Weinreb (president), R.A. Hitchings past president), E.L. Greve (executive vice president)


Glaucoma Society Representatives Committee: A. Ancier (SAGS), A. Brooks (ANZGC), F. El Sayyad (PAAGS), A. Euswas (AOGS), J. Ge (ChinGS), I. Goldberg (SEAGIG), A. Heijl (GSICO), T. Krupin (AGS), E. Maul (PAGS), H. Mishima (JGS), M.V. Patella (OGS), G.C. Parra (LAGS), P. Rafuse (CanGS), G.C. Sekhar (GSI), T. Shaarawy (ISGS), J. Thygesen (EGS)


Committee on Code of Practice: R.A. Hitchings (co-chair), Y. Kitazawa, R.A. Lewis (co-chair), R. Susanna, H.P. Pfieger (Allergan), M. Ypinga (Merck)


Committee on Guidelines for Diagnosis and Treatment of Glaucoma: H. Abe, I. Goldberg, J.M. Liebmann (co-chair), S. Obstbaum, G. Spaeth, R. Susanna, C. Traverso (co-chair)

Committee Global Research and Screening: A. Heijl (co-chair), H.A. Quigley (co-chair), M.R. Wilson (co-chair)
Subcommittee on Angle Closure Glaucoma: P.J. Foster, D.S. Friedman (co-chair), D. Lam, P. Rojana-pongpun, S. Seah (co-chair), R. Thomas, N. Wang, J. Zhao


Committee on Clinician Scientists: P. Khaw (co-chair), R.N. Weinreb (co-chair)


Membership AIGS
The AIGS is an association of Glaucoma Societies. It has no individual members. New or undiscovered Glaucoma Societies that desire to become a member of the AIGS are asked to contact the AIGS through GlobalAIGS@cs.com

The AIGS pursues the following relationship with her Glaucoma Societies:
- Cooperation and coordination on quality of glaucoma science and care
- Optimize communication
- Mutual support and learning
- Part of AIGS directory
- Coordinated calendar
- Meeting every two years at the World Glaucoma Congress
- Exchange of information through International Glaucoma Review, Consensus, Guidelines
- Global advocacy
- Review and coordination of Guidelines
- Website links
- Regular update from AIGS scientific committees
- Communal support in creating high level Glaucoma Society organization (see criteria for a Glaucoma Society)

National Glaucoma Societies will meet every two years at the World Glaucoma Congress. In between, communication will be mostly through e-mail exchange.

Inaugural Assembly Meeting
This will be the first time ever that the world’s Glaucoma Societies come together. Two representatives from the Executive Committee of each Glaucoma Society, representatives from the Glaucoma Industry Members and representatives from global Patient Organizations have been invited to this memorable event on Wednesday July 6, 10.30-12.00 in the Conference Center.

Agenda:
- Opening: R.N. Weinreb, President AIGS
- Goals of the AIGS: R.A. Hitchings, Past President AIGS
- History and Accomplishments: E.L. Greve, Executive Vice President AIGS
- Glaucoma Societies and Glaucoma Society Organization: R. Wilson, Co-chair Committee on Glaucoma Society Organization
- Introduction of Glaucoma Societies
- Guidelines for meetings: K. Singh, C. Migdal, Co-chairs Committee on Quality and Quantity of Glaucoma Meetings
- Discussion
  - How can more developed glaucoma societies support the advancement of less-developed glaucoma societies best?
  - How do we coordinate numerous and dissimilar glaucoma societies to more effectively pursue goals?
  - Are there other initiatives the AIGS should be pursuing?
- Interactive Questions on AIGS activities and cooperation.
- Closing

International Glaucoma Review – 20 years
IGR, which has been published since 1984, became the official journal of the AIGS in 2002. It is distributed to all members of the Member Regional Glaucoma Societies of the AIGS. The AIGS is investigating ways to also include all members of National Glaucoma Societies in the distribution.

IGR is a journal for glaucomatologists from all over the world. It aims at being a forum for the world’s Glaucoma Societies.

IGR expects to provide:
1. Efficient and easy availability, three times per year,
of virtually all glaucoma literature world-wide, with a critical review of selected papers.

2. Increased awareness of the activities of fellow Glaucoma Societies by means of co-operation and reporting.

The uniqueness of IGR is its attempted completeness, its classification, and the Editor’s Selection. IGR has the most complete collection of abstracts from the glaucoma literature which are otherwise not available, certainly not within the same time span. It is the only journal that presents a four-monthly critical review of selected glaucoma literature. Furthermore IGR contains announcements and reports from the Glaucoma Societies involved. It may also include complete selected papers, reports of meetings, interviews, opinions, hypotheses, reviews, and anything else considered to be of interest to the members of the Glaucoma Societies.

IGR online

All information in IGR (except the abstracts) is also available online. In addition IGR online provides information on Glaucoma Societies and additional reports. Webaddress: www.glaucom.com

GEM: the IGR glaucoma email announces upcoming online issues and communicates special news items to members of the glaucoma societies.

IGR is supported by a grant from the AIGS and advertising income.

History of IGR - an Editorial by Erik Greve which appeared in IGR volume 6, issue 1

International Glaucoma Review and its predecessor Glaucoma Abstracts have been serving the glaucoma interested community for 20 years. The first issue – much thinner than now with 62 pages – appeared in 1984. Glaucoma Abstracts, as the name was in these days, was an initiative of the European Glaucoma Society. The aim was and is to provide members of Glaucoma Societies with concise, classified information on glaucoma literature and more. It has been the best successor as president of the EGS that I could dream of.

The greatest joy for me after twenty years is the overwhelming enthusiasm with which IGR has been received over the years by my colleagues. Whenever I meet colleagues there are always several who spontaneously voice their appreciation for IGR as a quick, easily accessible source of top quality information on glaucoma literature and more. It has been a great experience to be able to work with the top experts in our subspecialty. My heartfelt gratitude goes to the editorial board and other reviewers. They create the quality of IGR. Robert Weinreb deserves a special thanks, because it was with him that I had the opportunity to create the last and essential changes: the transformation into the journal of the AIGS. Roger Hitchings was and is the other person who was instrumental in the transformation and has been the best successor as president of the EGS.

They have all helped me in various ways to get IGR where it is today: a highly appreciated source of information on glaucoma, on glaucoma societies, on glaucoma meetings supplemented with some wisdom, some poetry and some fun. That sounds like life.

AIGS-Award

The AIGS-Award is the only global glaucoma research award supported by all member Glaucoma Societies. The award was started in 1999.

Excerpt from the AIGS-Award Rules:

1.1 There will be two (2) awards per year for the purpose of stimulating creativity and originality and rewarding daring and breakthrough research in the field of glaucoma, to help protect the research time of junior researchers for the benefit of glaucoma patients. The award money is intended to be used for further research.

1.2 The AIGS-Awards will be presented to the two (2) best papers on glaucoma published in the scientific literature and reviewed by the IGR in each calendar year, starting from 1999.

1.3 Each AIGS-Award will consist of:
   (a) a total amount of USD 25,000
   (b) the AIGS-Award diploma; and
   (c) the AIGS-Award Crystal Bowl

2. The Nomination Committee

2.1 The Nomination Committee will consist of the Society Editors, each representing their own Glaucoma Society, as well as five (5) members of the editorial board of IGR.
3. The Selection Committee
3.1 The Selection Committee will consist of seven (7) members. These members will consist of the Managing Editor and six (6) members of the editorial board of IGR who have not served on the nomination committee.

6. Selection Criteria
6.1 The AIGS-Award will be presented to the researcher who actually conceived the idea, and who has been actively involved in transforming his/her idea into the published results of a well-presented study. This does not necessarily have to be the first author of a publication. It could also be a senior co-author, if the selection committee has information that he/she is the major contributor to the paper. The Award may also be presented jointly to more authors. The Award will be presented independent of age, and it can be presented more than once to the same researcher.

6.2 Publications selected for the AIGS -Award shall:
– Contain clinical or pre-clinical research fundamentally related to glaucoma;
– Be published in a peer-reviewed journal; and
– Represent original, creative, daring, and breakthrough research work.

7. The AIGS-Award Ceremony
7.1 The awardees will be invited to the Award ceremony.
7.2 The AIGS-Award ceremony will take place at a meeting of one of the Glaucoma Societies in the year following the year of publication.

AIGS-Award Winners 1999-2003

1999, London
Peng Khaw, Francesca Cordeiro, Ronald Harwerth

2000, Seoul
Paul Palmberg, Douglas Gaasterland, Harry Quigley

2001, Orlando
Michal Schwartz, Jack Crawford; Yeni Yücel, Robert Weinreb

Special Recognition
Douglas Anderson, Dunbar Hoskins, Stephen Drance

2002, Tokyo
Michael Kass, Mae Gordon, Anders Heijl

2003, Firenze
Elke Lütjen-Drecoll, Paul Kaufman, Paul Mitchell

The AIGS-Award 2004 Ceremony will be held on Thursday July 7, from 12.00-12.15 PM

The AIGS-Award is supported by an unrestricted educational grant from Pfizer Ophthalmics
TABBLAD ADVERTENTIE PFIZER
KEERZIJDE TABBLAD
ABSTRACTS

Opening Session
Didactic Program
Glaucoma Societies
Courses
Posters
Wednesday, July 6, 2005

2.00 – 2.35 pm.

O001 WELCOME – WORLD GLAUCOMA CONGRESS
R.N. Weinreb
La Jolla, CA, USA

Objective: to discuss the AIGS and the significance of this inaugural Congress.
Main message: Enhanced glaucoma care through improved education, better research and facilitated cooperation of all constituencies in the global glaucoma enterprise.

Concept: AIGS is a global organization that seeks to improve standards for glaucoma management and research, as well as to facilitate and coordinate communication and collaboration among its members (Glaucoma Societies, Glaucoma Industry, Glaucoma Foundations, Glaucoma Patient Societies and other relevant organizations).

Conclusion: The World Glaucoma Congress is an integral component of the diverse activities of the AIGS that seek to improve glaucoma care, education and research through cooperation and collaboration among all relevant stakeholders.

O002 INTERNATIONAL COOPERATION
O. von Habsburg

The medical sciences have made recently significant advances last not least due to the cooperation between the nations within the European Union. There remains much to be done in order that this progress should continue. From this point of view, the European Union should learn a lot from worldwide experiences. In the United States of America, Silicon Valley has developed into one of the most potent motors of progress. It has also attracted many of the scientists and technicians of Europe who need broader spaces and more freedom in their research so that Europe can achieve the progress which it’s past justifies. Such a decision would give a great impulsion to what has been in the past the glory of Europe and which taking into account the potential of our youth could entail a great promise for the future last not least in our medical sciences.

O003 GLAUCOMA COOPERATION IN ASIA
Y. Kitazawa
Tokyo, Japan

Objective: Overview the current, cooperative efforts made by glaucoma societies of Asian countries to promote a better understanding of glaucoma for betterment of patients’ care.
Main message: In the presence of a great diversity of problems countries are faced with the cooperative efforts made by glaucoma societies have been successful not only in giving birth to a consensus on the disease definition and guidelines but in exciting ophthalmologists’ interest in epidemiological survey.

O004 GLAUCOMA COOPERATION IN LATIN AMERICA
R. Susanna
São Paulo, Brazil

Objective: Overview of the glaucoma care in Latin America as well as the impact of OHTS, EMGT, AGIS in the glaucoma management in Latin America.
Main message: Glaucoma care in Latin America.

Conclusions: 1. The term Hispanic should not be used in scientific papers; 2. AGIS had a great impact in glaucoma management in Latin America; 3. OHTS and EMGT had less impact; 4. Beta-blockers are the first choice drug in glaucoma treatment.

O005 THE WORLD GLAUCOMA CONGRESS
E.L. Greve
Wijdemeren, The Netherlands

Objective: To enlighten the audience on the World Glaucoma Congress concepts and organization.
Main message: Global communication on glaucoma science and care.

Concept: WISC has an all star faculty; short didactic lectures and a host of extensive courses; Glaucoma Society involvement: Inaugural Assembly, Glaucoma Society sessions, nominated clinician scientists; special attention to posters: walkthrough, session, recognition, Evidence Based quality of presentations; unforgettable Imperial Viennese Gala Ball; evaluation; cost effectiveness.

Conclusion: 1. High Quality didactic meeting; 2. Original concept; 3. Healthy social program.

To turn experience into speech – that is, to classify, categorize, to conceptualize, to grammarize, to syntactify it – is always a betrayal of experience, a falsification of it, but only so betrayed can it be dealt with at all, and only in so dealing with it did I ever feel a man, alive and kicking.

John Barth
Glaucoma is considered as a major emerging problem for the control of blindness globally. As per recent WHO estimates, Glaucoma contributes to 12% of Global blindness, second only to cataract blindness and accounting for 10% of permanent vision loss in the world population. Two main forms of glaucoma are described: angle-closure glaucoma (ACG) and open-angle glaucoma (POAG). Landmark clinical trials, OHTS, EMGT, CIGTS, AGIS and CNTGS provided evidence for the cellular and molecular factors that cause or contribute to aqueous outflow resistance in the anterior eye and an increase in resistance. The turnover of the extracellular matrix, its isolation. From a public health perspective perhaps we would have a better chance of understanding of glaucoma's heterogeneity and genetic basis. Women are three times more frequently affected than men. The majority of POAG cases may be genetically determined. POAG is often a multifactorial disease and involves the interaction of gene and environment. In the majority of cases, POAG is caused by this group of diseases. To determine how this compares with other disorders in the public health spectrum. How does this impact on public health officials in developed and developing countries? How does this impact on those interested in glaucoma and its treatment?

Conclusions: 1. There is a difference in treatment opportunities between open-angle glaucoma and angle-closure. 2. To reduce visual disability costs, case detection rather than screening is of value for open-angle glaucoma, while screening followed by prophylactic laser intervention is of value for populations at higher risk of angle-closure.

D006 HOW DOES THE TRABECULAR MESHWORK FUNCTION? E.R. Tamm Regensburg, Germany

Objective: An intraocular pressure that is too high for the health of the optic nerve head is the risk factor for the pathogenesis of glaucoma. Fluid flow from the anterior chamber through the aqueous humor circulation system in the anterior eye and an increase in aqueous humor outflow resistance in the trabecular meshwork causes abnormally high intraocular pressure in primary open angle glaucoma (POAG). The identification of the cellular and molecular factors that contribute to aqueous outflow resistance in the trabecular meshwork is critical to understand the pathogenesis of POAG.

Main message: There is considerable evidence that most of the aqueous humor outflow resistance is generated in the juxtacanalicular part of the trabecular meshwork near the inner wall endothelium of Schlemm’s canal. A second ‘unconventional’ outflow pathway that are relevant to those affected. Other research questions (partly abstracted from a recent WHO publication) are: How does this impact on those interested in glaucoma and its treatment?

Conclusion: 1. A lot has been achieved, but (too) much remains to be done. 2. This is especially true for Angle Closure. 3. As specialists we tend to approach glaucoma in isolation. From a public health perspective perhaps we would have a better chance of understanding of glaucoma's heterogeneity and genetic basis. Women are three times more frequently affected than men. The majority of POAG cases may be genetically determined. POAG is often a multifactorial disease and involves the interaction of gene and environment. In the majority of cases, POAG is caused by this group of diseases. To determine how this compares with other disorders in the public health spectrum. How does this impact on public health officials in developed and developing countries? How does this impact on those interested in glaucoma and its treatment?

Conclusions: 1. There is a difference in treatment opportunities between open-angle glaucoma and angle-closure. 2. To reduce visual disability costs, case detection rather than screening is of value for open-angle glaucoma, while screening followed by prophylactic laser intervention is of value for populations at higher risk of angle-closure.

D006 PUBLIC HEALTH ISSUES IN GLAUCOMA I. Goldberg Boston, USA

Objective: To assess the ‘cost’ of glaucoma diagnosis, treatment and visual disability that is caused by this group of diseases. To determine how this compares with other disorders in the public health spectrum. How does this impact on public health officials in developed and developing countries? How does this impact on those interested in glaucoma and its treatment?

Main message: Glaucomas increase in prevalence exponentially with age. As the population ages, the fastest growing group is persons over 65 years, the most vulnerable group for glaucoma patients is set to rise even faster. For open-angle glaucomas, while screening is not cost-effective in developed as well as developing societies, case detection is worth-while: Upskilling of eye-care and health-care workers to improve case detection by identification of high-risk suspects and glaucoma cases is of value. For angle-closure, identification of high-risk subjects and use of prophylactic laser peripheral iridotomy and as needed peripheral iridoplasty will greatly reduce visual disability in identified ethnic groups, especially amongst Chinese and other Asian populations.

Conclusions: 1. There is a difference in treatment opportunities between open-angle glaucoma and angle-closure. 2. To reduce visual disability costs, case detection rather than screening is of value for open-angle glaucoma, while screening followed by prophylactic laser intervention is of value for populations at higher risk of angle-closure.
morphogenetic protein-7 with transforming growth factor-β causing an increase and bone morphogenetic protein-7 a decrease in extracellular matrix synthesis of trabecular meshwork cells. Conclusion: Resistance to aqueous humor outflow depends on the amount and nature of the extracellular matrix in the trabecular meshwork. An increase in extracellular matrix in POAG likely correlates with an increase in aqueous humor outflow resistance, while a therapeutically induced decrease in matrix synthesis of trabecular meshwork cells might be a promising therapeutic approach to treat POAG.

D007 WILL WE BE ABLE TO SEE APOPTOTIC RETINAL GANGLIA CELLS?
M.F. Cordellio
London, United Kingdom

The detection of degeneration of retinal ganglion cells (RGCs) has previously not been possible in vivo. Instead, patients with glaucoma are currently screened and monitored clinically using conventional perimeter to identify a typical pattern of visual field loss. However, it has been estimated that up to 20-40% of RGCs are lost before field defects are detected by this method. Clinicians and clinical trials are therefore clearly inadequate at detecting early glaucomatous visual functional deficits. We have devised a new, non-invasive real-time imaging technique using confocal laser scanning ophthalmoscopy to visualize single retinal ganglion cell apoptosis in vivo. This allows longitudinal study of disease processes, which has not previously been possible. We have been able for the first time to image changes occurring in RGC apoptosis over hours, days and months, and show effects depend on the magnitude of the initial apoptotic inducer in several glaucoma-related models. This novel technique is an important advance in glaucoma because: 1. It is potentially a powerful clinical tool with which to diagnose and identify early glaucoma, before they lose vision; 2. It opens the door to directly observing effects of therapeutic strategies in glaucoma, by allowing for the study of potential neuroprotective drugs using meaningful endpoints that are based on the direct assessment of RGC death; 3. It may serve as a surrogate biomarker, providing real-time information that could dramatically reduce the number of glaucoma clinical studies, which currently have to use visual field status as a key endpoint and determinant of outcome.

D008 IS GLAUCOMA A SYSTEMIC DISEASE CURABLE BY THERAPEUTIC NEURO-PROTECTIVE VACCINATION?
M. Schwartz
tel-Aviv, Israel
Glaucoma has often been linked etiologically to high intraocular pressure (IOP). It is now evident that IOP is only one of several risk factors, albeit the most common. The search for additional primary risk factors suggests that disease from progressing has opened up research in neuroprotection and neural cell turnover. We have shown that the body’s defense and maintenance resource, the immune system, helps fight off the causes of glaucomatous neurodegeneration. After a primary insult, lymphocytes (T cells) home to their specific eye-resident antigens, where they render the local immune cells (microglia) protective in a way that the eye can tolerate. To prevent or at least retard disease progression, we developed a vaccination that boosts the T-cell response. The antigens of choice are synthetic peptides that cross-react weakly with retinal and optic nerve antigens and induce a response that allows their specific T cells to home to the lesion site and become weakly activated there in a way that leads to neuroprotection without risk of autoimmunity. Our studies suggest that glaucoma, like other neurodegenerative diseases, although manifested at the site of disease, is also systemic in nature. Aging or other triggers of immune system deregulation might therefore be key factors leading to ongoing progression of the disease, but also in its onset. Accordingly, the age-related intensification in risk increases the demand for assistance from the peripheral immune system. A T-cell-based therapeutic vaccination might be therefore viewed as a means of bridging the widening gap between need and risk, thereby restoring homeostasis.

D009 GLAUCOMA MORE THAN THE EYE OF THE BEHOLDER
Y.H. Yucel
Toronto, Ontario, Canada
Objective: To review the experimental and human evidence that glaucoma is a disease that extends beyond the eye to involve major vision centers in the brain. The clinical relevance with respect to glaucoma disease detection, progression and treatment will also be discussed.

Main message: The death of retinal ganglion cells in glaucoma leads to the degeneration and loss of their target neurons in the brain. This spread of disease from affected neurons to connecting neurons is in keeping with transsynaptic degeneration, also seen in neurodegenerative diseases. The number of studies point to neurochemical and neuropathological changes involving the anterior optic pathway, the lateral geniculate nucleus and the visual cortex in experimental and human glaucoma. Understanding the nature of central visual system abnormalities in glaucoma will lead to new insights into the pathophysiology of glaucomatous injury and vision loss, and effective new treatment strategies.

Conclusions: 1. Degenerative processes in glaucoma extend to central visual pathways in the brain and involve transsynaptic degeneration; 2. In moderate and advanced glaucoma, degenerative changes in the brain are transsynaptic in nature and proportional to optic nerve damage; 3. In early glaucoma, alterations at neuron connection sites in the lateral geniculate nucleus may occur prior to detectable optic nerve fiber damage and contribute to early visual dysfunction; 4. A multidisciplinary strategy understanding brain changes in glaucoma may contribute significantly to new insights into the disease process and its optimal treatment.

D010 WHAT DAMAGES THE OPTIC NERVE IN GLAUCOMA?
R.N. Weinreb
La Jolla, CA, USA

1. Glaucoma is a neurodegenerative disease characterized by the slow, progressive degeneration of retinal ganglion cells; 2. The pathophysiology of glaucomatous neurodegeneration is not fully understood; 3. The level of intraocular pressure is unquestionably related to the death of retinal ganglion cells (RGCs) and optic nerve fibers in some, if not all, patients with primary open angle glaucoma; 4. Other factors can individually or collectively contribute to RGC and optic nerve fiber death: a. ischemia-hypoxia; b. Excessive stimulation of the glutamatergic system; c. Dysfunctional cells transporters; 3. Oxidative stress and formation of free radicals; e. Aberrant immunity.
D016 WILL TRABECULECTOMY SURVIVE?
R.A.L. Lewis
Sacramento, CA, USA

Despite well recognized short and long term complications, trabeculectomy has been the principal incisional procedure for glaucoma for almost 50 years. Will trabeculectomy survive? The tremendous advance in our understanding of ocular anatomy and disease has fostered a variety of alternative approaches to treating glaucoma.

Objective: To review the many novel procedures under consideration to achieve the ultimate therapeutic goal in glaucoma which is to maintain and/or restore vision.

General concepts: (1) IOP lowering procedures, (2) optic nerve neuroprotection/regeneration, and (3) vision restoration. IOP lowering surgery will focus principally on those procedures that increase outflow by allowing the egress of fluid using physiologic as well as nonphysiologic, artificially, created channels of the cornea, sclera, canal of Schlemm and suprachoroidal space. Recent breakthroughs in optic nerve regeneration and vision restoration will be discussed. The glaucoma patient of the future is not likely to be offered a conventional trabeculectomy procedure to lower intraocular pressure. Instead, the treatment will focus on a more customized approach based on specific disease parameters and unique individual characteristics to control IOP as well as restore visual function.

I am endowed with a cheerful temper, a moderate sensibility, and a natural disposition to repose rather than activity; some mischievous appetites and habits have perhaps been corrected by philosophy or time. The love of study, a passion which derives fresh vigour from enjoyment, supplies each day, each hour, with a perpetual source of independent and rational pleasure, and I am not sensible of any decay of the mental faculties. The original soil has been highly improved by cultivation; but it may be questioned whether some flowers of fancy, some grateful errors, have not been eradicated with the weeds of prejudice.

Edward Gibbon
Main message: SLP provides quantitative measures of retinal nerve fibre layer (RNFL) thickness. CSLT is: 1. a useful adjunct to a clinical examination for diagnosis; 2. prognostic in Dr. Johnson’s talk, which will discuss other improvements to perimetry that selectively test specific aspects of visual function for improved diagnosis and management of glaucoma.

Conclusions

Main message: SLP provides an objective measure of RNFL thickness; 2. Its reproducibility is high; 3. Its role in follow-up of glaucoma is not yet determined, but appears promising.

Main message: SLP provides an objective measure of RNFL thickness; 2. Its reproducibility is high; 3. It is probably detecting glaucoma earlier than standard automated perimetry; 4. Its role in the detection of progressive nerve fiber layer damage in glaucoma.

Conclusions

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Main message: SLP provides an objective measure of RNFL thickness; 2. Its reproducibility is high; 3. It is probably detecting glaucoma earlier than standard automated perimetry; 4. Its role in the detection of progressive nerve fiber layer damage in glaucoma.
D027 ABNORMAL VISUAL FUNCTION IS NOT REQUIRED FOR THE DIAGNOSIS OF GLAUCOMA
G. Coff. Portland, OR, USA

Glaucosa is characterized as a progressive optic neuropathy that develops in the face of a number of different risk factors. The most important and identifiable of these risk factors is intraocular pressure (IOP). Although this does not seem necessary in all patients, it is the driving force in development of disease. Our understandings of the relationship between the structural change of the optic nerve and the functional deficits that result have evolved over time. These forces have shaped the studies about the structure/function relationship. In the past, functional deficit has been a requirement for diagnosis; however, we now realize that structural abnormalities may occur without overt signs of functional decline. The forces that have shaped our thoughts about the structure/function relationship are our clinical ability to measure a change (that is, the sensitivity of our testing paradigms) and our understand- ing of the relationship of retinal ganglion cell death over time. We have moved from a macro-view of glaucomatous optic neuropathy to a micro-view. With this evolution, our testing paradigms for both structural and functional change have increased in sensitivity. In many respects, our ability to detect structural change has been better than our ability to detect functional change. This talk will focus on the changing paradigm of the structure/function relationship and why an abnormal visual function test is not required for the diagnosis of glaucoma.

D028 UPDATE ON CONSENSUS ON STRUCTURE AND FUNCTION
R.N. Welebre, E.L. Greve
La Jolla, CA, USA

Objectives: To summarize, discuss and update the consensus points obtained from the inaugural AIGS consensus meeting on glaucoma diagnosis (structure and function) that was held in San Diego on November 13-14, 2003.

Statements:
1. A method for detecting abnormality and also documenting optic nerve structure should be part of routine clinical management of glaucoma. Explanation: It is known that the normal appearance of the optic nerve structure is often missing in routine ophthalmology practice. 2. According to limited evidence available sensitivity and specificity of imaging instruments for detection of glaucoma are comparable to that of expert interpretation of stereo-colour photography and should be considered when such expert advice is not available. Explanation: Experts evaluating stereophotographs are those who have had special training in this area in this technique. 3. Digital imaging is recommended as a clinical tool to enhance and facilitate the assessment of the optic disc and retinal nerve fibre layer in the management of glaucoma. Explanation: Digital imaging is available for scanning laser tomography, scanning laser ophthalmoscopy and optical coherence tomography. Digital imaging also is possible for photography, but assessment remains largely subjective. 4. Automated analysis of results using appropriate databases is helpful for identifying abnormalities. Explanation: The comparison of results of examination of individual patients with those of an appropriate database can delineate the likelihood of abnormality and also document abnormalities. 5. Different imaging technologies may be complementary, and detect different abnormal features in the same patient. Explanation: At all this time, evidence does not preponderantly support any one of the above structural tests for diagnosing glaucoma.

Function: 6. A method for detecting abnormality and documenting functional status should be part of routine clinical management of glaucoma. 7. It is unlikely that any functional test assesses the whole dynamic range. 8. Standard Automated Perimetry (SAP), as usually employed in clinical practice, is not optimal for early detection. 9. With an appropriate normative database, there is emerging evidence that short wavelength automated perimetry (SWAP) and possibly also frequency doubling technology perimetry (FDT) may be used to detect glaucoma earlier than SAP. Explanation: Earlier detection of glaucomatosus damage with SWAP and FDT than with SAP has been consistently demonstrated. 10. There is little evidence to support the use of a specific selective visual field test over another clinical practice because the few studies with adequate comparisons. Explanation: At this time, there is no evidence to support the use of a specific selective visual field test over another clinical practice because the few studies with adequate comparisons.

Function & Structure: 11. Published literature often lags behind the introduction of new technology. Therefore literature based on previous versions of current technology should be viewed with caution. 12. In different cases, either structural examination or functional testing may provide more definitive evidence of glaucoma, so both are needed for detection and confirmation of the subtle early stages of the disease. 20. Data from both functional and structural examinations always should be evaluated in relation to all other clinical data.

10.30 – 12.00 am.

D029 RISK FACTORS FOR PROGRESSION OF GLAUCOMA
B. Friedman
Baltimore, MD, USA

Objective: To review the evidence in the literature for risk factors for glaucoma progres- sion.

Main Message: Publications have documented that some persons with primary open-angle glaucoma are more likely to progress during follow-up than others. Understanding which persons are at increased risk can help clinicians optimize their strategies to prevent or delay these diseases. This presentation will review the literature on this topic.

Conclusions: 1. Some persons with glaucoma are progressing more rapidly than others; 2. Risk factors that are known are associated with greater risk of progression; 3. Assessing each patient’s risk will improve the care given.

D030 FUNCTION ASPECTS OF PROGRESSION
B. Girkin
Halifax, Canada

Objective: To provide a practical guideline for the clinical use of perimetry for detecting progression in glaucoma.

Main Message: 1. The importance of measuring functional progression: 2. Discuss the techniques and tools for measuring progression and their relative merits; 3. Stress the importance of variability and how to interpret it; 4. Stress that the detection of progression usually requires several examinations in the case of actual progression. This is particularly important in a slowly progressing disease like glaucoma.

Conclusion: 1. Detection of functional progression is a cornerstone of clinical practice in glaucoma; 2. There is no external ‘gold-standard’ for glaucoma progression and that pro- gression criteria are necessarily arbitrary.

D031 STRUCTURE ASPECTS OF PROGRESSION
D.H. Parrish II
Birmingham, AL, USA

Objective: To review current techniques of assessing the optic nerve subjectively and with optic nerve and retinal nerve fiber layer analyzers in the detection of progressive glauco- ma and its injury.

Main message: Subjective assessment of the optic disc and nerve fiber layer is critical in detecting progression in glaucoma. Objective imaging techniques show great promise in the detection of progressive disease. However, prospective data with current imaging modalities are only available for confocal scanning laser ophthalmoscopy.

Conclusion: 1. Structural progression can occur without concurrent visual field progres- sion; 2. It is critically important in early to moderate glaucoma. 3. Subjective evaluation remains the primary methods of detecting structural progression; 4. Objective analysis techniques are promising adjucants in detecting progression.

D032 FUNCTION AND STRUCTURE ASPECTS OF PROGRESSION
L.M. Zangwill
La Jolla, CA, USA

Objective: To review the evidence documenting the temporal relationship between detect- able structural and functional change in glaucoma.

Main Message: The temporal relationship between detectable structural and functional change in glaucoma is influenced by the type of structural and functional testing com- pared. Objective measurement scales for detection of disease progression may improve the accuracy of specific perimetry to detect functional change suggest that with current diagnostic tech- niques, structural and functional testing provide largely independent measures of progres- sion. The similarities and differences in the methods for structural and functional assessment will be reviewed and the results of these studies compared.

Conclusions: 1. With current diagnostic techniques structural and functional testing pro- vide largely independent measures of glaucomatous progression; 2. Glaucoma manage- ment should include both structural and functional testing.

D033 QUALITY OF LIFE AND GLAUCOMA I
R.K. Parrish
Miami, FL, USA

Objective: Understand the concept of measuring quality of life and visual function, and explain the differences between them. Understand the difference among general, organ specific, and glaucoma specific testing instruments.

Main message: Glaucoma affects quality of life in ways that may be measured with general health (SIP, SF-36), organ specific (VF-14), and disease specific instruments. Correlations between self reported quality of life, visual function, and objective measures of glaucomatous optic nerve or visual field damage depend on the type of instrument used to measure the effect. Generally speaking, the more vision specific the questionnaire, the less generalizable are the results to general health quality of life function. Patients with advanced optic neuropathy may have few measurably reduced functions when tested with general quality of life instruments. Bilateral simultaneous visual field testing (Estesman) results approximate daily visual field functioning, whereas the more functional determination of ‘time trade off’ by asking a patient how many years of life expectancy they would exchange for perfect visual function may offer another subjective assessment of impact of glaucoma.

Conclusions: Visual function, a complex product of visual acuity, peripheral visual field, and higher cortical function affects the quality of life. Different testing instruments may provide insight about how specific diseases affect the quality of life. Comorbidities, such as chronic illness, may impact quality of life as measured with organ specific instruments.


D034 QUALITY OF LIFE AND GLAUCOMA II – IMPACT OF GLAUCOMA ON VISION-TARGETED HEALTH RELATED QUALITY OF LIFE
M.A. Araie
Tokyo, Japan

Worldwide, about 150 million people are estimated to be visually disabled and glaucoma is the second most common cause of visual impairment. The concepts of quality of life include physical functioning, health perception, emotional well-being and satisfaction of patients. A better understanding of impact of glaucoma on patients’ vision-targeted health related quality of life, that is, patients’ perception of capacity for visually independent daily living, should be important in estimating patients’ status, clinical management and estimat- ing benefits of treatment, just as other concepts such as introduced ‘quality of life’. Pressure or perimetric performance. To know patients’ perception of visual disability, the use of questionnaires where patients self-assess their skills and abilities is probably the most accurate and efficient means at present. So far, several questionnaires have been developed to estimate vision-targeted health related quality of life in patients with ocular disorders, and studies applying these questionnaires to glaucoma patients revealed that glaucoma patients perceive visual disability even in the early stage of the disease and that a significant correlation exists between perceived disability and the visual field loss, especially that in the lower central hemifield. Glaucoma is a rather unique ocular disorder where central visual acuity is often retained until the late stage of the disease. Thus, a questionnaire intended to assess visual disability caused by visual field impairment rather than visual acuity impairment may be more useful in managing
D033 THE MOLECULAR GENETICS OF GLAUCOMA
W. Alward
Iowa, IA, USA

Objective: To review the current state of knowledge of the genetics of glaucoma.

Main message: The genes for various forms of glaucoma are being discovered. There are now seven known chromosomal loci for primary open angle glaucoma (POAG). These loci are felt to harbor disease-causing genes – they are called GLC1A through GLC1G. For three of these loci the genes have been discovered (myocilin, optineurin, and WDR36). Genes have been described for other forms of glaucoma as well such as primary congenital glaucoma (CYP1B1), aniridia (PAX6) and Axenfeld-Rieger syndrome (PITX2 and FOXC1). The study of glaucoma genetics promises to improve our diagnosis and treatment of glaucoma.

Conclusions: 1. There are three genetic loci for POAG (GLC1A – GLC1G); 2. There are three identified POAG genes (myocilin, optineurin, and WDR36); 3. There is one identified gene for congenital glaucoma (CYP1B1); 4. There are genes identified for several developmental glaucomas.

D034 SYSTEMIC FACTORS IN EXFOLIATION SYNDROME AND EXFOILIATIVE GLAUCOMA
R. Ritch
New York, NY, USA

Exfoliation syndrome (XFS) is an age-related disease characterized by the production and progressive accumulation of a fibrillar extracellular material in many ocular tissues. It has only recently been recognized to be the overall most common identifiable cause of glaucoma, and in some countries accounts for the majority of the glaucoma. Exfoliation-like fibrils have been found in many organs by electron microscopy, suggesting it to be a generalized or systemic disorder of the extracellular matrix, long recognized only in the eye because of its visibility on slit-lamp examination and the fact that it causes glaucoma. Associations with systemic disorders and blood flow abnormalities are being increasingly reported. These include elevated plasma homocysteine, transient ischemic attacks, stroke, aortic aneurysm, angina, myocardial dysfunction, myocardial infarction, systemic hypertension, Alzheimer’s disease and hearing loss. Reported blood flow abnormalities, both in the eye and in the brain, include reduction of flow in the middle cerebral artery, optic nerve, and peripapillary retina. However, two series have reported no increase in mortality rates in patients with XFS, while another reported that comorbidity with acute cerebrovascular disease and chronic cerebral diseases were more common in patients with exfoliative glaucoma than in patients with primary open-angle glaucoma. Further studies are warranted.

Order in daily life and in history, order in the social and political category is unattainable . . . . where is it attainable? . . . . the work of art stands up by itself, and nothing else does . . . . it is the one orderly product which our muddling race has produced.

E.M. Forster


D035 GONIOSCOPY
S. Friedman
Baltimore, MD, USA

Objective: Documentation of angle findings is critical to glaucoma diagnosis and treatment. This presentation will review the optimal approaches to gonioscopy in clinical practice.

Main Message: Angle-closure glaucoma is likely underdiagnosed, leading to improper treatment and potential vision loss in patients. Understanding how to assess the angle in a systematic fashion in low illumination can improve diagnostic precision. Various grading methods are available and will be reviewed. Angle changes induced by excessive illumination will also be demonstrated.

Conclusions: 1. Gonioscopy should be performed on all patients over 40 years of age; 2. All individuals followed for glaucoma or ocular hypertension should have regular gonioscopy; 3. Gonioscopy needs to be performed with minimal illumination; 4. Unimal anterior chamber depth offers additional information to guide physicians and also can be incorporated into clinical practice.

D036 DIAGNOSIS UBM
P. Rojana-Pongpun
Bangkok, Thailand

Objective: Demonstrate how to use UBM in diagnosis and understand the different mechanisms of angle closure (AC) glaucoma. To present UBM criteria and case samples.

Main Message: UBM provides high resolution images of anterior segment structures and their relationships by using 50 MHz high frequency transducer that yields axial resolution to 25μ by lateral resolution of 50μ. Interpretation and analysis can be made qualitatively and quantitatively. Pupillary block can be easily identified by characteristic contour of iris. UBM reveals an increase in iris-lens contact after LPI. This provides new insight that sphincter muscle force, which thought to play an important role in AC, has very little effect as trigger mechanism for AC. UBM also demonstrates that anterior rotation and elongation of ciliary process causes plateau iris configuration that lead to AC. More importantly, UBM provides information on dynamic change of angle structures in light and dark condition which may yield important information on hidden mechanisms in certain cases. Anterior chamber depth, iris thickness and posterior chamber area can be visualized, thus help in understanding some of the less well defined mechnaism like peripheral angle crowding and lens component in mixed AC mechanism. UBM is also useful to study medication on angle structure change. For quantitative analysis, new parameters and algorithms have been introduced to enhance the usefulness of UBM in both diagnosis and follow up of progression.

Conclusions: UBM becomes an essential diagnostic tool in differentiating various underlying mechanisms of AC. Both qualitative and quantitative analysis can be performed to provide more information that are used in diagnosis as well as detect dynamic change of the angle structure.

D037 DIAGNOSIS OF ANGLE CLOSURE WITH OCT
Tin Aung
Singapore National Eye Centre; National University of Singapore

Objective: To review recent advances in imaging for angle closure glaucoma using OCT.

Main Message: Recent advances in imaging have led to more objective ways of defining the angle. The anterior segment optical coherence tomography (AS-OCT) is a non-contact instrument that rapidly obtains high-resolution images of the angle. The detection of angle narrowing is an objective and reproducible parameter; The image capture scan takes less than 10 seconds and there are no side-effects to this imaging.

Conclusions: The AS-OCT is a promising new tool for the diagnosis of angle closure glaucoma.

D038 DIFFERENTIAL DIAGNOSIS IN PRIMARY ANGLE-CLOSURE
J. Lester
London, United Kingdom

Objective: To discuss the differential diagnoses for various stages of primary angle-closure and angle-closure glaucoma.

Main Message: Differential diagnosis of primary angle-closure differs according to the stage of the disease and the physical signs on which the diagnosis has been considered. A. Narrow drainage angle (different from ‘primary’ mechanism). Gonioscopic artefact. Supra-ciliary effusion: e.g. VKH syndrome, following heavy retinal laser. Ciliary body and iris cysts. Lent-induced. Retro-lenticular forces: e.g. intraocular haemorrhage, vitreo-retinal traction made worse by longstanding diseases. Systemic or locally administered medication. B. Primary angle-closure (defined by narrow angle with PAS or raised IOP). i. Peripheral anterior synechiae. Goniodysgenesis. Neovascularization of iris and angle (diabetic, retinal vein occlusion, Coats’s dis.). Neoplastic deposits or infiltrates. Iris-corneal endothelial syndrome. Primary iridoischisis. II. High ocular hypertension with corneal oedema. Hypertensive uveitis (esp. Poenier Schizschmann-Fyhn, where gonioscopy may be difficult due to corneal oedema. Other causes of secondary glaucoma. C. Primary angle-closure glaucoma. Primary open angle glaucoma. Secondary glaucoma. Mixed mechanism glaucoma.

Conclusions: Several differential diagnoses should be considered when confronted with a case of angle-closure.

D039 RESULTS OF PERIPHERAL IRIDOTOMY
R. Thomas, G.C. Shekar, R. Parikh
Hyderabad, India

Objective: To report the results of Laser Peripheral Iridotomy. Main Message: As shown to be the appropriate treatment, LPI has replaced surgical iridotomy as the standard of care. The techniques (and lasers) used to achieve the iridotomy vary and results are probably the same; however, the Nd-YAG LPI is probably the most popular technique today. The results depend on the stage of the disease as well as the mechanism. Acute Angle Closure Glaucoma (AAG): LPI has been shown to be effective in protecting fellow eyes from acute attacks; experts agree on its efficacy and safety in this situation. The outcome of LPI for IOP control in AAGC is itself is not impressive, varying from 41% in the milder cases to 6% of the severe cases. It would seem that most patients with AAGC will require more than just an LPI. PACG (occludable angles): LPI can be performed on a population based model and do return cumulative results. Patients are expected to progress to Primary angle closure glaucoma (PAC) and very few are expected to advance to disc/field damage; fewer still to blindness. The number Needed To Treat (NNT) is not known, but this is to prevent PACG (not damage PACG), let alone blindness. The NNT to prevent PACG is 21. Even with the more aggressive nature of PACG, for prevention of blindness, the NNT will be much higher and over a much longer duration. Keeping this in mind, it is really necessary to (over) treat at PACI, especially since the long term effects of LPI on IOP and other possible side effects are still debated. The results of a study that compared PACG and PACG versus no treatment are awaited. In addition to the effectiveness of LPI in PACG (and screening), the study should also provide valuable information about potential complications. PACG-LPI is currently standard of care for PAC; LPI does seem to prevent progression from PAC to PACG; the NNT of four is clinically significant (The NNT to prevent blindness would be higher). There is evidence in the literature for a higher success rate in PAC versus those who have disc/field damage (PACG). In early PACG however, one study reported that 73% of angles could be opened and the IOP controlled with LPI alone. There was no difference between those with or without disc and field changes. Medical treatment was required to control IOP in 10%. Indoplaty was needed to open the angle in 25% of cases; these were considered by the authors to be plateau iris. There was perfect concordance of results between the two eyes of patients who had a LPI; the result in one eye was predictable in the other.

Conclusions: 1. Prophylactic LPI is effective in fellow eyes of APACG; 2. LPI is the mainstay of treatment for AAGC, PACG and PACG; 3. Success rates seem to decrease with increasing severity of disease (disc damage, marked field defects); 4. Success rates also depend on the mechanism. Plateau iris will require further treatment to open the angle and control IOP. 5. The results and consequences of LPI for PACS are not clear.

D040 WHAT TO DO AFTER PERIPHERAL IRIDOTOMY?
P. Chew
Singapore

The problem of residual angle closure after an iridotomy in patients with primary angle closure glaucoma is a major issue. Often iridotomy in patients with asymptomatic chronic angle closure glaucoma does not lower pressure significantly in the majority of Asian patients. Additional medical therapy is needed and perhaps as many as a third of patients will require surgical intervention. The evaluation of the angle after iridotomy does show that a proportion of patients, about a third, have elements of angle crowding that benefit from additional laser therapy in the form of iridoplasty. I will show images of angles before and after iridoplasty using anterior segment OCT to demonstrate the different clinical behaviours of such patients. In symptomatic angle closure however, iridotomy is more effective in lowering IOP. Yet about 25% of patients will go on to develop chronically raised intra-ocular pressure. This pressure rise is asymptomatic with onset typically three to six months after the presentation of the acute attack. Various risk factors like presenting pressure and angle width post iridotomy are also significantly associated with the chronicity of pressure rise post iridotomy. There is a need to evaluate post iridotomy eye management critically in the light of this information.

D041 ACGL TREATMENT OPTIONS
S. Friedman
Baltimore, MD, USA

Objective: To review the evidence supporting various treatments for primary angle-closure glaucoma.

Main Message: Angle-closure glaucoma management is in evolution. Recent research indicates that both acute and chronic forms of the disease can be managed by multiple approaches. Some treatments, such as iridoplasty, are widely used, but very little is published showing its long-term effectiveness. We will explore the options for treatment and the need for further research will be the focus of this talk.

Conclusions: 1. Management of PACG is evolving; 2. Many strategies may be effective at preventing progression in persons with PACG; 3. More research is needed to help guide physicians caring for patients with PACG.

D042 A ROLE FOR CATARACT EXTRACTION?
D-S-C Lam
Hong Kong, China

Objective: To discuss the role for cataract extraction in the management of angle closure glaucoma. Main Message: Angle-closure glaucoma is a major issue. Often iridotomy in patients with asymptomatic angle closure glaucoma does not lower pressure significantly in the majority of Asian patients. Additional medical therapy is needed and perhaps as many as a third of patients will require surgical intervention. The evaluation of the angle after iridotomy does show that a proportion of patients, about a third, have elements of angle crowding that benefit from additional laser therapy in the form of iridoplasty. I will show images of angles before and after iridoplasty using anterior segment OCT to demonstrate the different clinical behaviours of such patients. In symptomatic angle closure however, iridotomy is more effective in lowering IOP. Yet about 25% of patients will go on to develop chronically raised intra-ocular pressure. This pressure rise is asymptomatic with onset typically three to six months after the presentation of the acute attack. Various risk factors like presenting pressure and angle width post iridotomy are also significantly associated with the chronicity of pressure rise post iridotomy. There is a need to evaluate post iridotomy eye management critically in the light of this information.

D043 OCT SHOULD BE MEASURED IN ALL PATIENTS
J.D. Brandt
Sacramento, CA, USA

Objective: To review the data supporting the recommendation that central corneal thickness (CCT) be performed in ALL patients.
Main message: The measurement of CCT became accepted as an important part of the glaucoma exam after the findings of the Ocular Hypertension Treatment Study (OHTS) that CCT was a powerful independent indicator of development of glaucoma among OHTS participants. Thus the most powerful support for integrating pachymetry into the ophthalmic exam is for ocular hypertensives. There is accumulating evidence to support routine pachymetry in all patients, and CCT is becoming an important item in the exam.

Conclusions: 1. The strongest level of evidence (randomized clinical trials; RCTs) supports routine pachymetry among ocular hypertensives; 2. The next level of evidence (multiple case-controlled retrospective studies) supports pachymetry for newly-diagnosed and established glaucoma patients; 3. The growing population of patients who have undergone LASIK will dramatically affect our ability to perform accurate tonometry in the future. 4. A growing body of evidence supports the proposition that pachymetry become a routine part of the ophthalmic examination.

D044 CCT SHOULD NOT BE MEASURED AT ALL PATIENTS
M. Destefanos
College of Medicine, Cambridge, United Kingdom

Objective: According to the OHTS findings ‘thin’ CCT is believed to be a significant risk factor. Why? Patients with ‘thin’ corneas seemed to have progressed more often then other patients. CCT provides us with pm data from the centre of the cornea. The mean central corneal thickness of healthy eyes may be in the range of 555 ± 40µm. CCT shows circadian variation and may be influenced with topical therapy. Different measurement techniques lead to different results. There is also variation of data when different equipment is used even from the same corneal thickness by the same investigator. The CCT is just one parameter in the complex formula of IOP calculation. How about curvature and rigidity in buphthalmos or Lasik/Lasek? The Goldmann Tonometer is calibrated for standard corneal thickness (520µm), standard radius of curvature (r=7mm) and also standard cornea ‘rigidity’. OAT is based on the Imm-Buck-Fick. The four preceeding mechanisms could be carefully planned. The cornea is not ball shaped and perfectly spherical; 2) the surface is not an endlessly thin membrane without rigidity; 3) corneal stromal fluid is a瘠uous shifted to the trabecular meshwork and the posterior chamber; 4) tear film adhesion forces do occur during measurements. The Goldmann tonometer gives us only a hint of the intraocular pressure. There are numerous errors and adjust-ments which led to a reading precision in the range of ±1 mmhg – that is ±2 mmhg! In their original paper in Ophthalmologica in 1957 Goldmann and Schmitt mentioned that there are numerous possibilities for faulty readings. To date the observer, eye related reading errors still seem to outweigh the equipment related one by far: corneal astigma-tism, ceratitis, scarring, corneal surgery, microphthalmos, buphthalmos, nystagmus, hypertension, chronic treatment with diuretics or the spread of fluorescein during measurements. Not to mention the inter-observer variability in healthy eyes IOP varies – 6 mmHg and in glaucoma – 20 mmHg within 24 hours. We measure IOP for about two seconds every ~ 6 month (!) and claim to know the IOP of our healthy eyes IOP varies ~ 6 mmHg and in glaucoma ~ 20 mmHg within 24 hours. We do not need to buy a pachymeter. Even if you should know the CCT of the eyes, do not feel safe or believe that you understand the IOP better than before and why the patients get worse. In the vast majority of patients it is about papilla and visual field, adherence to treatment improvement and 50 had a greater than 10% risk of missing a 25% treatment improvement and 50 had a greater than 10% risk of missing a 50% treatment improvement and 50 had a greater than 10% risk of missing a 50% treatment improvement. To best serve their patients, how-ever, ophthalmologists have no choice but to learn to identify the studies on which to base their practice. Basic skills required to make such decisions, and present better approaches.

Conclusions: 1. You do not need to measure CCT in all DH or glaucoma patients. You do not need to buy a pachymeter. Even if you should know the CCT of the eyes, do not feel safe or believe that you understand the IOP better than before and why the patients get worse. In the vast majority of patients it is about papilla and visual field, adherence to treatment and not ‘thin’ CCT; 2. Measure the IOP more often! 3. We need to have an intraocular telemetric system to show us the real data we would like to discuss; 4. Hans Goldmann would go for it!

D045 DISK HEMORRHAGES ARE NOT THE MOST IMPORTANT RISK FACTOR
K. Ishida
Gifu, Japan

Introduction: Disc hemorrhage (DH) at the optic nerve head is common in glaucoma. The prevalence of DH reported by previous investigators varies: 2 to 37% in patients with primary-open-angle glaucoma, 20 to 46% in NTG, and 0.4 to 10% in ocular hypertension. Obviously, DHs are observed more often in patients with NTG. Objective: To investigate the relationship between DH and progression of NTG and to show topological relationship between the DH and visual field (VF) or nerve fiber layer.

Methods: Study 1: We followed 70 untreated NTG patients with a mean follow-up period of 5.6 years, and applied a regression analysis of survival data based on the Cox propor-tional hazards model. Several clinical factors were investigated to find a possible associa-tion with the progression of DH. Study 2: We defined two different criteria: one by MD and one by VF, and evaluated the progression of DH by glaucoma change probability analysis. Study 2: Forty-two NTG patients developed new DHs were examined by SLO, to determine topographic correlation between DH and NF. Results: Study 1: We found that DH progression was significantly greater for patients with DH than for patients without DH (p<0.01). All eyes that had at least two DHs progressed, whereas 33% showed progression in the non-recurrent DH (p<0.01). Furthermore, 65% of DH locations corresponded to the VF areas where progression was demonstrated. Study 2: Of the 84 DHs, 80% of DHs occurred near the borders of the retinal nerve fiber layer and adjacent to healthy-looking retina. Progression was demonstrated. Study 2: Of the 64 DHs, 80% of DHs occurred near the borders of the retinal nerve fiber layer and adjacent to healthy-looking retina. Study 2: Of the 64 DHs, 80% of DHs occurred near the borders of the retinal nerve fiber layer and adjacent to healthy-looking retina. Main message: Although evidence-based medicine (EBM) was first described in 1981, ophthalmic journals have only recently started to incorporate its principles. Even the best American ophthalmic journals continue to use a case series. Patients who are not, and in those in the treated arm and the controls, if the number of patients lost to follow-up is small and the same between treat-ment and control arms, and both the patient and investigator are masked. With the intro-duction of trade newspapers like Occular Surgery News which are often biased and non-peer reviewed, and the influence of industry in research and ophthalmology meetings, these numbers may be slipping rather than improving. To best serve their patients, how-ever, ophthalmologists have no choice but to learn to identify the studies on which to base their practice. Basic skills required to make such decisions, and present better approaches.

Conclusions: 1. Approximately half of all patients with manifest glaucoma, i.e. glaucoma with visual field defects on standard white-on-white automated perimetry, are undiagnosed in the Western world. 2. Many patients with undiagnosed glaucoma have considerable field loss, and a large percentage of glaucoma patients have serious field loss in at least one eye when first diagnosed. 3. Normal tension glaucoma is often, or maybe routinely, missed in ophthalmic clinical care. 4. Different measurement techniques in a number of different ways aim at identifying functional or structural defects. 5. Population screen-ing for glaucoma must be highly specific in order to be feasible. 6. In population screening for glaucoma one must accept that some early glaucoma is missed. 7. Screening tests for population screening and the interpretation of such tests must be different than those tests and screening tests from the ophthalmic care, and they must be tested for that purpose. 8. Population screening should be targeted to well selected groups with reasonable risk for manifest glaucoma. Age is the most important factor. 9. Population screening for glaucoma must be performed in conjunction with other well known and important risk factors such as elevated IOP, myopia, pseudoexfoliation, family history, decreased perfusion pressure and others.

D047 SCREENING FOR POAG IS FEASIBLE
A. Heijl
Malmö, Sweden

Objective: To explain why and under what conditions that screening for POAG is feasible.

Main message: 1. Approximately half of all patients with manifest glaucoma, i.e. glaucoma with visual field defects on standard white-on-white automated perimetry, are undiagnosed in the Western world. 2. Many patients with undiagnosed glaucoma have considerable field loss, and a large percentage of glaucoma patients have serious field loss in at least one eye when first diagnosed. 3. Normal tension glaucoma is often, or maybe routinely, missed in ophthalmic clinical care. 4. Different measurement techniques in a number of different ways aim at identifying functional or structural defects. 5. Population screen-ing for glaucoma must be highly specific in order to be feasible. 6. In population screening for glaucoma one must accept that some early glaucoma is missed. 7. Screening tests for population screening and the interpretation of such tests must be different than those tests and screening tests from the ophthalmic care, and they must be tested for that purpose. 8. Population screening should be targeted to well selected groups with reasonable risk for manifest glaucoma. Age is the most important factor. 9. Population screening for glaucoma must be performed in conjunction with other well known and important risk factors such as elevated IOP, myopia, pseudoexfoliation, family history, decreased perfusion pressure and others.

D048 SCREENING FOR GLAUCOMA IS NOT FEASIBLE
R. Wormald
London, United Kingdom

Objective: To discuss the problems and difficulties in designing a glaucoma screening programme

Main message: These are numerous and include: Defining the disease; Defining the population at risk; Choosing the right tests; Defining the screening interval; Monitoring quality.

Conclusions: Screening for glaucoma is not feasible but complicated.

10.30 – 12.00 am.

D049 EVIDENCE-BASED AND VALUE-BASED MEDICINE
R.P. Wilson
Philadelphia, PA, USA

Objective: Discuss the nature of the evidence ophthalmologists use to make patient care decisions, and present better approaches.

Main message: Although evidence-based medicine (EBM) was first described in 1981, ophthalmic journals have only recently started to incorporate its principles. Even the best American ophthalmic journals continue to use a case series. Patients who are not, and in those in the treated arm and the controls, if the number of patients lost to follow-up is small and the same between treat-ment and control arms, and both the patient and investigator are masked. With the intro-duction of trade newspapers like Occular Surgery News which are often biased and non-peer reviewed, and the influence of industry in research and ophthalmology meetings, these numbers may be slipping rather than improving. To best serve their patients, how-ever, ophthalmologists have no choice but to learn to identify the studies on which to base their practice. Basic skills required to make such decisions, and present better approaches.

Conclusions: The best estimate is that only between 10 and 35% of clinical care is based on the results of best evidence defined as randomized, controlled clinical trials. Another 15 to 40% is based on some degree of scientific evidence. However, 35 to 50% is based on individual perceptions, expert opinion, or uncontrolled biased case series. With the intro-duction of trade newspapers like Occular Surgery News which are often biased and non-peer reviewed, and the influence of industry in research and ophthalmology meetings, these numbers may be slipping rather than improving. To best serve their patients, how-ever, ophthalmologists have no choice but to learn to identify the studies on which to base their practice. Basic skills required to make such decisions, and present better approaches.

Thursday, July 7, 2005
gists are able to ask these questions and discern the answers, they will be able to use the best evidence available to support their patients. Value-based medicine is the next step. Value is measured by objectively quantifying 1) the improvement in quality of life and/or 2) the improvement in length of life conferred by an intervention. After factoring in the costs associated with an intervention, cost-utilty analysis is used to prove the interventions sanctioned by EBM are cost-effective for society to adopt.

**D053 WHAT DO WE LEARN FROM EGPS FOR OUR PRACTICE**

P. R. Healey
Sydney, Australia

**Objective:** To assess how the Ocular Hypertension Treatment Study (OHTS) might influence the clinical practice of ophthalmology. The OHTS followed 1536 participants aged 40–80 years with ocular hypertension, randomised to pressure lowering medication or observation. It has provided insights into the natural history of ocular hypertension and the effects of IOP lowering on progression will only be known when the patient cohort reaches 80 years of age. This study had important implications in the hypothesis, design, conduct and interpretation of the study.

**Main message:** The Ocular Hypertension Treatment Study continues to provide new and important information to guide decision making.

**D054 NEW INFORMATION FROM EMGT**

S. Miglot
Montecatini Terme, Italy

**Objectives:** To report the predictive factors of primary open angle glaucoma (POAG) in patients affected by ocular hypertension (OHT) enrolled in the European Glaucoma Prevention Study (EGPS).

**Main message:** In univariate analyses, baseline factors that predicted the development of POAG included older age, higher IOP, larger vertical c/d ratio, larger vertical c/d ratio asymmetry, higher pattern standard deviation (PSD), thinner central corneal thickness (CCT), pseudoxfation (PEx) and cardio-vascular diseases. In multivariate analyses, when adjusting for mean IOP reduction during the follow-up, baseline factors that predicted the development of POAG included older age, larger vertical c/d ratio, larger vertical c/d ratio asymmetry, higher PSD and thinner CCT. A smaller mean IOP reduction throughout the follow-up from baseline was also associated with the development of POAG.

**Conclusions:** Baseline age, vertical c/d ratio, vertical c/d ratio asymmetry, PSD and CCT were good predictors for the onset of POAG in the EGPS. Central corneal thickness was found to be a powerful predictor for the development of POAG. The results of the MEET agreement with the findings of OHTS and EMGT and support the need for a global evaluation of the patients with OHT.

**D055 WHAT DO WE LEARN FROM EGPS FOR OUR PRACTICE**

K. Singh
Stanford, CA, USA

**Objective:** To discuss the impact of the Early Glaucoma Prevention Study on glaucoma practice.

**Main message:** While EGPS has added additional high quality evidence to the existing literature, questions in the hypothesis, design, conduct and interpretation of the study have resulted in the study findings adding little to our overall understanding of glaucoma therapy.

**Conclusions:** The Early Glaucoma Prevention Study has had minimal impact on glaucoma practice.

**D056 NEW INFORMATION FROM AGIS**

A. Heijl
Malmö, Sweden

**Objective:** Update on current status of EMGT and its results. Main message: Objectives of EMGT have been met; EMGT receives no more funding from NIH; EMGT data are still analyzed and further publications can be expected; 4. The EMGT patient cohort is unique and will continue to be followed with a different follow-up protocol and with support from the Swedish Research Council; 5. The goals for this second study of the same patient cohort are different, and are centred on questions of visual field progression; 6. The question of whether immediate treatment in newly detected early glaucoma is important for the patient remains crucial, and can only be finally answered by continued follow-up of this patient cohort; 7. To recruit patients for the second stage of EMGT was associated with large population screening, Malmö Eye Survey 2.

Follow-up of patients in Malmö Eye Survey have recently shown: a. That exfoliation syndrome is an IOP-independent risk factor for glaucoma in patients with ocular hypertension; b. Mortality is the same in glaucoma patients as in subjects without glaucoma.

**Conclusions:** EMGT and studies related to EMGT continue to provide important data. The impact of the EMGT will depend on the quality of the results, the timing of their publication, and the aims. Continued follow-up of this cohort remains the only available opportunity to answer the crucial question of whether immediate treatment or waiting for progression makes any difference for the patient with newly detected early glaucoma.

**D057 WHAT DO WE LEARN FROM EMGT FOR OUR PRACTICE**

E. Birgiera
Buenos Aires, Argentina

**Objective:** To bring to the attendees concise information from latest EMGT results, relevant for clinical practice.

**Main message:** Lowering IOP in an average of 25% in newly diagnosed white OAG patients with early glaucomatous damage reduced in half the risk of progression at six years (hazard ratio = 0.50; 95% CI, 0.35-0.71). Progression was observed earlier and was more frequent in the control than in the treated group. The more the IOP was reduced, the better the outcome. This is consistent with what has been observed for Ocular Hypertension in the OHTS. According to the authors’ analysis, each lower millimeter of mercury of IOP on follow-up may be associated with an approximate 10% decrease in risk of progression. This may or may not be true in the ‘real world,’ since the effect of the drug on the lens and the pupil function call for larger randomized trials, to determine if a treatment which may not be distinguished from the aging effect. The number necessary to treat (NNT) was 5.9 (around one third of the calculated for OHT in which was far more reasonable). Increased risk of progression in EMGT was associated with higher baseline IOP, exfoliation, bilateral disease, worse mean deviation, and older age, as well as less frequent disc hemorrhages. This information opens the door for increasing the efficiency of our treatment by adjusting the individual target IOP according to the found risk factor.

The average amount of visual field change (considering three consecutive visual fields) never exceeded mean EMGT visual field loss for a longer period. An increase of 0.6 dB a month was associated with a higher risk of progression, which may or may not be considered a treatment threshold which may or may not be distinguished from the aging effect. The number necessary to treat (NNT) was 5.9 (around one third of the calculated for OHT in which was far more reasonable). Increased risk of progression in EMGT was associated with higher baseline IOP, exfoliation, bilateral disease, worse mean deviation, and older age, as well as less frequent disc hemorrhages. This information opens the door for increasing the efficiency of our treatment by adjusting the individual target IOP according to the found risk factor.

**D058 NEW INFORMATION FROM AGIS**

P. Palmberg
Miami, FL, USA

The Advanced Glaucoma Intervention Study was a landmark study of the long-term outcomes of glaucoma interventions. Continuing analysis is yielding useful information about the pressure-dependence of glaucoma damage, risk factors for progression, how to distinguish progression from fluctuation, and about the long-term effectiveness and complications of filtering surgery and laser trabeculoplasty. AGIS was conducted from 1988 until 2002, following the outcomes of 1200 eyes of 600 patients randomized to initial laser trabeculoplasty or glaucoma filtering surgery. Some 451 eyes of 332 patients, 325 eyes of 249 white patients and 126 eyes of 101 African American patients benefited from IOP lowering by 20% to prevent progression to open angle glaucoma.
Wednesday, September 20, 2005

D057 WHAT DO WE LEARN FROM AGIS FOR OUR PRACTICE?

D. Minckler
Los Angeles, CA, USA

Objective: Brief summary of important clinical applications of AGIS-related publications

Main message: AGIS has taught us that different outcomes should be expected by race for sequential laser and surgery interventions in glaucoma. According to AGIS publications, 3.6% of African American eyes developed a visual field defect, whereas 12.6% of non-black eyes developed a visual field defect. In this study, we also reported that trabeculectomy-laser trabeculectomy (TAT) was more effective in whites. Current application of these AGIS conclusions however should be integrated with medication and laser technology advances since their publication. Also it should be kept in mind that the original hypotheses for the study did not anticipate racial differences in outcomes subsequently derived from post-hoc analyses.

Conclusions: 1. The AGIS visual field scoring system has confirmed that serial automated perimetry is a reliable method of documenting progressive glaucoma injury; 2. AGIS confirmed that trabeculectomy and the trabeculectomy-related trabeculotomy treatment works relatively well, even without antibiotics; 3. AGIS data indicates that relatively low IOP levels (12-14 mmHg) are protective against further visual field loss.

D058 ENVIRONMENTAL RISK FACTORS IN GLAUCOMA

P. Berson
Westmead, Australia

Objective: This paper aims: 1) To review known and hypothesised ocular, systemic and environmental risk factors for open-angle glaucoma, based on findings from the Blue Mountains Eye Study (BMES) and other large population-based studies of older populations; and 2) To document risk factors associated with elevated IOP levels. Risk factors that can influence or may reflect risk of optic nerve head damage, such as myopia, peripapillary atrophy (beta-PPA), pseudoexfoliation (PXF), optic disc haemorrhage, and optic disc size, together with central corneal thickness (CCT). The BMES odds for glaucoma in multivariate models were: 1) myopic refraction (at least 1 dioptre), a 2-fold risk; odds ratio (OR) 1.9, 95% confidence interval (CI) 1.2-3.2; 2) beta-PPA, a 3-fold risk; OR 3.0 (CI 1.9-4.7); 3) PXF, a 3-fold risk; OR 2.8 (CI 3.1-6.2) and 4) optic disc haemorrhage, a 10-fold risk; OR 10.4 (CI 5.0-21.7). Identified systemic and environmental factors include diabetes, hypertension, and, more recently, thyroid disease, particularly hypothyroid state. Although the magnitude of increased glaucoma risk associated with each of these factors indicates high prevalence of elevated blood pressure, means that this factor may have a relatively high 'high frequency' risk. Other risk factors for POAG were: 1) myopia, a 2-fold risk; OR (2.0). (CI 1.1-3.7); 2) thymus disease, a 2-fold risk, OR 2.1 (1.1-4.4) and 3) hypertension, an 80% higher risk, OR 1.8 (CI 1.1-2.7). Lifestyle factors did not appear to influence glaucoma prevalence. Many such ocular, systemic and environmental factors have also been shown to influence IOP. Most of these variables, however, only have a modest impact on IOP levels, and each typically associated with differences of around 0.5 mmHg or less. In the BMES, blood pressure (BP), diabetes, myopia, thyroid disease, PXF, and current smoking were all significantly associated with modest elevations of IOP. Caffeine consumption was associated with slightly higher IOP levels in glaucoma cases. Our data indicate ambient BP as the principal IOP-related stress and strain should be expected to affect the physiology and pathophysiology of the OHN axostries and axons at all levels of IOP.

D059 ALL GLAUCOMAS HAVE A PRESSURE COMPONENT

C. Burgoyne
New Orleans, LA, USA

Objective: To explain the biomechanical relationships between intraocular pressure (IOP) and IOP-related stress and strain within the optic nerve head (ONH) connective tissues.

Main message: Intraocular pressure related stress and strain are always present within the neural and connective tissues of the ONH. Their magnitude may be substantial even at low levels of IOP and may exceed the elastic limits of normal or damaged connective tissues at all levels of IOP. Elevated levels of IOP-related stress and strain may separate influence both the volume flow of blood within the peripapillary and laminar capillaries and the diffusion of blood some nutrients from the laminar capillaries to the overlying astrocytes and adjacent axons. 'Glaucomatous' (in relation to the above concepts) is the name that we give to the appearance the ONH assumes when its neural and connective tissues are damaged by IOP-related stress and strain, regardless of the actual mechanism of damage or the level of pressure at which that damage occurs.

Conclusions: The biomechanical stress and strain should be expected to affect the physiology and pathophysiology of the OHN astrocytes and axons at all levels of IOP.

D060 NOT ALL GLAUCOMAS HAVE A PRESSURE COMPONENT

J. Liebmann
Basel, Switzerland

We all agree that an increased intraocular pressure is the main risk factor for glaucoma-related damage. The fact, however, that the majority of patients with increased IOP will not acquire damage and that a large portion of patients with glaucomatous damage do have IOP levels that are relatively low, are two parameters that appear to be interesting. Furthermore, the diversity of patients progress despite a normalized IOP, sometimes even at a very low IOP. Among these factors are systemic factors, that seem to be important. This assumption is supported by the fact that blood flow to the eye in majority of glaucoma patients is decreased, specially when challenged (see Course No 16). Furthermore, a number of different systemic alterations, such as e.g. low blood pressure at night, can be found more frequently in glaucoma patients than in non-glaucoma patients (see Course No 33). For most of the relevant factors, we do not yet know, how far they can lead to a glauco-matous damage by themselves and how far they rather increase the sensitivity to IOP and IOP fluctuation. Furthermore, at present we have only a few intervention studies, indicating that improving this factors may indeed improve prognosis. The lack of these studies, however, does not indicate that these factors are not important. In the future we may put much more emphasis on these factors both for diagnosis and for treatment.

D061 GLOBAL GUIDELINES ON DIAGNOSIS AND TREATMENT

C.E. Travassos, J.M Liebmann
New York, NY, USA

This is a time of rapid advancement in our understanding of glaucoma. This new information spans basic biology, epidemiology, disease detection, treatment, and new ways to preserve vision. We are fortunate that our electronic world allows for rapid transfer of information across borders and regions at a rapid rate. Undoubtedly, the digital age is having a huge impact on the detection of disease and the delivery of healthcare worldwide; standards of care and access to care however vary immensely among and within the various geographical areas. The purpose of these guidelines in to provide a foundation to help improve the ability of ophthalmologists to deliver quality care to our patients wherever they may be found. There will be no piecemeal format. The changes in the eye nerve-yards we acknowledge that no single set of guidelines can be applied to every situation, we believe that the guidelines that provide a firm foundation for the enhancement of glaucoma care worldwide and its potential to help redress this and other disparities. Our goal is to help the patients. Global guidelines for any medical field are only a scaffold onto which regional, national or local guidelines should be applied. Any set of guidelines is by definition, a living document. We expect that this first set of global guidelines will evolve as our knowledge about glaucoma increases. We look forward to those advances.

10.30 – 12.00 am.

D062 RELATIONSHIP BETWEEN ANTERIOR AND POSTERIOR SEGMENT MORPHOLOGY AND PATHOPHYSIOLOGY

E. Lütjen-Drecoll
Erlangen, Germany

Objective: To better understand the pathophysiology of glaucoma diseases changes in the trabecular meshwork of eyes with primary open angle glaucoma (POAG) and pseudexfoliation glaucoma (PEXG) were compared with changes in the optic nerve.

Results: The cause of TM changes in the two glaucoma groups seems to be different. In PEXG eyes with POAG there was a significant increase of the so called 'SD plaques', whereas in PEXG pseudoexfoliation material filled the subendothelial region of Schlemm's canal. The amount of PEXG material in the TM correlated significantly with axon loss in the optic nerve in eyes with PEXG and the amount of 'plaques' with axon loss in eyes with POAG. The morphology of the TM changes was, however, completely different from the changes within the optic nerve. In most optic nerves of PEXG there was no PEX material within the nerve and in eyes with POAG there was no plaque formation. The changes in the optic nerve were qualitatively similar within the two groups of glaucomatous eyes. Both optic nerves showed a fibrosis of the septa, capillary loss in the septa and a specific form of axon degeneration with little gliosis. In eyes with POAG the fibrosis and capillary loss was, however, significantly more pronounced than in PEXG eyes. Conclusion: The cause of TM changes in the two glaucoma groups seems to be different in the different kinds of glaucoma diseases. The similarity in optic nerve changes could be due to the increased pressure present in the eyes of both groups. The quantitative differences between the two groups of glaucomatous eyes point towards additional factors increasing susceptibility for IOP induced changes in eyes with POAG. It is hypothesized that these factors might participate in both TM and optic nerve changes in POAG eyes.

D063 THE MOUSE MODEL IN GLAUCOMA RESEARCH

J.G Growton
La Jolla, FL, USA

Objective: To describe current possibilities and future opportunities of the mouse model in glaucoma research.

Main message: The mouse eye shares a number of similarities with the human eye with respect to anatomy, physiology and aqueous humor dynamics. Furthermore, transgenic technology has led to establishment of naturally occurring glaucoma models in the mouse and also permits evaluation of the consequences of single gene mutations on the patho-physiology and treatment of glaucoma. The development of techniques that permit the measurement of aqueous humor dynamics and retinal imaging in the mouse eye provide further opportunities for this model.

Conclusion: The laboratory mouse is likely to play an ever increasing role in glaucoma research.

D064 PREDICTIVE DNA TESTING FOR GLAUCOMA

D. Craig
Bedford, Australia

Objective: Glaucoma is a complex genetic disorder with contributions from multiple genes. The presentation seeks to summarize progress in understanding glaucoma genetics and examine current possibilities for genetic predictive testing for glaucoma using clinical examples. Obstacles and future possibilities will be discussed.

Main message: A number of genes for glaucoma have been recently identified including MYOC, CYP1B1, OPTN, PEPH1. This wealth of direct DNA testing currently offers the possibility of predictive (presymptomatic) testing in certain families. We have shown strong patient acceptance of this in the case of MYOC. In areas with a high frequency of congenital glaucoma, prenatal diagnosis has been facilitated by the identification of CYP1B1. There are reported associations of genetic polymorphisms with glaucoma but few have been replicated in multiple populations and more research is required in this area.

Conclusions: 1. In carefully selected families with proven disease-causing glaucoma mutations,
predictive testing is already possible and there is good patient acceptance of this; 2. Currently funding of this testing is problematic; 3. At this time, the majority of unselected glaucoma patients have unknown genes / mutations and therefore more research is required for widespread applicability; 4. Great future possibilities exist for predictive testing and risk profiling for glaucoma as more genes and their significance are carefully studied in multiple populations, and the cost of genetic screening falls.

D065 DIOPTANTIBODY PROFILES IN GLAUCOMA
F.H. Grus
Mainz, Germany

Purpose: Although an elevated intraocular pressure represents the main risk factor, it cannot explain the glaucoma disease in all patients. Previous studies could provide hints for an involvement of autoantibodies in the pathogenesis of the disease. The aim of this study was to analyze the use of autobody repertoire for the diagnosis of glaucoma.

Furthermore, we attempted to test the glaucoma-specificity of these antibodies comparing them to antibody repertoire found in retinal diseases and to confirm some of these reactivities by proteinchip analyses.

Methods: 430 patients were divided into four groups: healthy volunteers without any ocular disorders (n=150), patients with primary open angle glaucoma (POAG, n=100), normal tension glaucoma (NTG, n=80). To test the robustness of the glaucoma detection, in an additional procedure 100 patients with other ocular disorders (e.g. retinal diseases) were included in the non-glaucoma control group (CTRL2). All groups were matched for age and gender. The sera of patients were tested against Western blots of retinal and optic nerve antigens. Protein-A beads were used to capture the antibodies against retinal and optic nerve antigens.

Results: All groups revealed complex autobody patterns against ocular antigens. Elevated and decreased antibody reactivities compared to controls could be found in glaucoma patients. The diagnostic value of the antibody patterns as a tool for the diagnosis of glaucoma could be assessed by calculating receiver operating (ROC) curves. Including both healthy subjects and other retinal diseases, the artificial neural network could reach an area under curve (r-value, ROC-curve) of 0.91. The Seldi analysis could demonstrate significant differences (P<0.05) in the antibody reactivities between all groups according to the Western blot results.

Conclusion: Changes in the natural autoimmunity in glaucoma patients could be demonstrated again. The role of these antibodies remains unclear, but the decreased antibody reactivities might correlate with a loss of protection in autoimmune mechanisms. In this study, we could demonstrate that pattern matching algorithms such as artificial neural networks could be used to detect glaucoma based on autobody patterns specific for this disease. Furthermore, the glaucoma specificity of these antibody profiles could be proved by comparison to antibody profiles in patients suffering from retinal diseases.

D066 OXIDATIVE DAMAGE IN GLAUCOMA
G.T. Tzatz
Louisville, KY, USA

Objective: Retinal ganglion cells (RGCs) have been shown to be susceptible to reactive oxygen species (ROS), and the survival of axotomized RGCs has been found to be critically sensitive to the oxidative redox state. Ongoing efforts aim to identify the importance of oxidative damage in glaucomatous neurodegeneration.

Main message: Growing evidence supports that oxidative damage is involved in the neurodegenerative process of glaucoma, which can be induced by elevated intracellular pressure and/or tissue hypoxia at the optic nerve head and retina of glaucomatous eyes. We in vitro studies using primary cultures of RGCs provided evidence that the ROS death induced by different glaucomatous stimuli involves both receptor-mediated caspase activation and mitochondria-mediated caspase-dependent and caspase-independent components of the cell death pathway. In addition, these in vitro studies revealed that the caspase-independent component of mitochondrial cell death pathway involves the amplified production of ROS and that anti-oxidant treatment improves the survival of caspase inhibited RGCs. We also performed proteomic analysis to determine whether retinal proteins are oxidatively modified during glaucomatous neurodegeneration in ocular hypertensive eyes; and if so, what the targets are for protein oxidation in these eyes. Immunohistochemistry were utilized. The identified proteins included glyceraldehyde-3-phosphate dehydrogenase, a glycylcotic enzyme; hsp72, a stress protein; and glutamine synthetase, an excitotoxicity-related protein. Since GAPDH, hsp72, and glutamine synthetase are known to play important roles for cell survival and/or function in the retina, their free radical-mediated modification may result in impaired cellular homeostasis eventually contributing to neurodegeneration.

Conclusions: Thus, the evidence supporting the involvement of oxidative damage in glaucomatous neurodegeneration includes: (1) Amplified production of ROS in response to different glaucomatous stimuli, in vitro, as well as axonal injury, leads to RGC death; (2) Protein modification by ROS occurs to a great extent in the retina of ocular hypertensive eyes, in vivo; and (3) Anti-oxidant treatment provides neuroprotection to RGCs during glaucomatous neurodegeneration. These suggest that anti-oxidant treatment is a promising neuroprotective strategy to improve the survival of RGCs for the therapeutic gain of glaucoma patients.

D067 APOPTOSIS SIGNALING IN NEURONS
L. Levin
Madison, WI, USA

Objective: Review the primary mechanisms by which axonal damage signals apoptosis.

Main message: Retinal ganglion cell (RGC) death is the final common pathway for virtually all optic neuropathies, including glaucoma. In most cases the primary injury is to the RGC axon, but it is controversial how axonal damage eventually results in RGC death. One mechanism is neurotoxic deprivation, but it is unclear if this is a signaling mechanism in neurons after development. We examined the effect of acute axotomy on RGC survival, and found that certain reactive oxygen scavengers (ROS) protot survival of acutely axotomized RGCs in vitro. In addition, there is a rise in superoxide anion after axotomy, leading to our hypothesis that ROS serve as intracellular signaling molecules for RGC death after axotomy. If so, this could serve as a critical point for therapeutic intervention (neuroprotection).

D068 GENE DELIVERY IN EXPERIMENTAL GLAUCOMA
K.R.D. Martin
Cambridge, United Kingdom

Objective: To review the methods by which genes can be delivered to retinal ganglion cells. In particular, the use of adeno-associated viral vectors will be considered and the potential use of gene therapy in the future treatment of glaucoma and other optic nerve diseases will be discussed.

Main message: Gene therapy techniques have great potential in the future treatment of glaucoma.

Conclusions: Human diseases with single gene defects such as Leber’s hereditary optic neuropathy may soon be treated successfully by gene therapy, assuming that vectors continue to improve and are well tolerated in the human eye. Other optic nerve diseases such as glaucoma that do not have a single gene defect may also benefit from gene therapy to enhance RGC survival. In all cases, the risks of treatment will need to be balanced against the potential benefits.
9.00 – 10.00 am.

**D069 MECHANISMS OF ACTION OF GLAUCOMA MEDICATION**

P. Kaufman

Madison, WI, USA

Objective: To demonstrate the value of prostainglandin analogues as initial therapy in the treatment of glaucoma and ocular hypertension.

**Main message:** Prostaglandin analogues such as bimatoprost, latanoprost, and travoprost lower intraocular pressure (IOP) by approximately 30-35% and provide a sustained ocular hypotensive effect with once daily application. In comparison to other classes of agents, including nonselective beta-adrenergic antagonists and carbonic anhydrase inhibitors, these agents are associated with a low incidence of topical allergies and a relatively low rate of discontinuation. Although their ocular side effects are well described, the use of prostaglandin analogues avoids the systemic side effects associated with topical beta-adrenergic antagonists, carbonic anhydrase inhibitors.

**Conclusions:** In summary, prostaglandin analogues represent the most effective choice for initial glaucoma therapy due to: 1. excellent and sustained ocular hypotensive effect with once daily administration; 2. ability to maintain a relatively flat diurnal IOP curve; 3. mechanistic enhancement of outflow; 4. low incidence of topical allergies; 5. relative lack of systemic side effects.

**D070 PROSTAGLANDINS ARE FIRST CHOICE**

Y. Kuwayama

Osaka, Japan

Objective: To verify whether beta-blockers can be still first choice in glaucoma treatment. 1. Relative disadvantages of beta-blockers: A. Systemic side-effects: 1. Pulmonary; 2. Cardiac: Oral Beta-blockers, however, are now known to improve heart function and prolong the lives of patients with chronic heart failure; 3. Depression and CNS; 4. Reduction in HCL level; 5. Masking hypoglycemic symptoms; 6. Sexual dysfunction. B. Effectiveness in lowering IOP: Less potential than prostaglandins. Circadian variation in IOP lowering effect. II. Relative advantages of beta-blockers: A. Favorable and well-known local side-effect profile: No iris color change, no skin discoloration, no eyelash growth. Quite important to the compliance; B. Effectiveness in lowering IOP: Usable in any type of glaucoma. Reduction of peak IOP; C. Convenience of use: D. Low cost; E. Good stability without need for refrigeration; F. Greater than 20 years of clinical experience. III. The aim of glaucoma management is to maintain quality of vision and quality of life. Since the beta-blockers are not all glaucoma patients need bearing long eyelashes and darkened eyelids. I have argued that beta-blockers remain the good first choice in patients without obvious systemic contraindications to their use.

**D072 IS THERE A PLACE FOR COMBINATION DROPS?**

R. D. Fiscella

Newark, NJ, USA

Objective: Review the benefits and limitation of combination drops.

**Main message:** Topical medical therapy remains the first line of treatment in the management of glaucoma. Utilization studies and clinical trials have demonstrated that many patients with glaucoma require multiple medications to achieve adequate control of intraocular pressure. Fixed combinations of commonly used drugs have been developed, starting with epinephrine/philocarpine and timolol/brimonidine. In 1998, timolol/brimonidine fixed combination was introduced. More recently latanoprost/timolol fixed combination received regulatory approval and was introduced in parts of the world. Other combination products have been studied in large registration trials and await approval. The obvious benefit to fixed combination therapy over concomitant therapy is convenience. Using a fixed combination reduces the number of bottles per day that patients have to keep up with. This, in turn may also reduce the number of drops per day, but unless the dosing frequency is also reduced, fixed-combination therapy doesn’t always significantly impact quality of life. Cost is also a potential benefit for patients on fixed-combinations. For patients with prescription drug benefits who make a co-payment for each prescription filled, using a fixed combination can eliminate one co-payment. But for patients with no prescription drug benefit, branded combination therapy is often more expensive than concomitant generic therapy.

**Conclusions:** 1. The first consideration when contemplating fixed-combination therapy for patients should be: does the patient need two IOP-lowering medications? 2. The second consideration should be: are all of the ingredients in the combination right for the patient? Potential regulatory studies: may benefit from the comparison to the separate fixed treatment but the combination should be used only if the patient’s initial treatment regimen would include the constituent drugs separately; 3. Fixed combinations offer benefits of convenience, cost, and hence limited individualized titration. Understanding the advantages and disadvantages of prescribing fixed combinations facilitates success in using these products in clinical practice.

**D073 MAXIMUM MEDICAL THERAPY**

S.A. Gandolli

Parma, Italy

Objective: The presentation will try to offer criteria for (a) defining, (b) planning, (c) introducing, (d) monitoring and (e) withdrawing a maximally tolerable medical therapy in 2005.

**Main message:** MMT is the most aggressive medical approach to glaucoma. Several classes of compounds (combos included) are presently available. Drugs with complimentary mechanisms of action are likely to offer the best risk-efﬁcacy proﬁle. However, the effectiveness of the proposed schedule may be weighed against (a) side-effects; (b) freedom from the need for lifelong treatment; (c) Q.O.L., (d) long-term local and systemic toxicity and (e) the risk-beneﬁt proﬁle of surgery in the individual eye.

**Conclusions:** The best medical therapy, when not feasible, becomes the worst possible therapy in chronic glaucoma (f).
Main message: Review the animal studies for neuroprotection, then describe the clinical trials in progress or recently completed that test neuroprotection in glaucoma. Conclusions: Although a lower IOP is generally considered beneficial to the eye, the risk of vision loss with surgery must outweigh the risk of vision loss with surgery. 2. Surgery for glaucoma is indicated when: a. Optimum medical therapy and/or laser surgery fails to sufficiently lower IOP; b. A patient does not have access to or cannot comply with medical therapy. 3. Clinicians should screen for candidates for surgery. 4. The goal of care for the patient with glaucoma is preservation of sufficient vision to maintain independence. Goals of Glaucoma Care: 1. The goal of care for the patient with glaucoma is preservation of sufficient vision to maintain independence. 2. The means to achieve this goal are to reduce or eliminate the intraocular pressure-related threat to vision. Assumptions: 1. Every patient has a unique manifestation of disease and interaction between disease, treatment and quality of life. 2. There are no clearly defined and accepted rules to dictate when surgery is the appropriate therapeutic choice, but there are principles that guide this decision. 3. It is not possible to know a priori what level of IOP will be needed to substantially slow or halt glaucoma and preserve quality of life; 4. IOP lowering should provide risk reduction for the development or progression of glaucoma and is not, by itself, the goal of therapy. D084 INDICATIONS FOR GLAUCOMA SURGERY R.D. Fechtner Newark, NJ, USA 1. The decision for surgery should consider the risk/benefit ratio. Although a lower IOP is generally considered beneficial to the eye, the risk of vision loss with surgery must outweigh the risk of vision loss with surgery. 2. Surgery for glaucoma is indicated when: a. Optimum medical therapy and/or laser surgery fails to sufficiently lower IOP; b. A patient does not have access to or cannot comply with medical therapy. 3. Clinicians should screen for candidates for surgery. 4. The goal of care for the patient with glaucoma is preservation of sufficient vision to maintain independence. Goals of Glaucoma Care: 1. The goal of care for the patient with glaucoma is preservation of sufficient vision to maintain independence. 2. The means to achieve this goal are to reduce or eliminate the intraocular pressure-related threat to vision. Assumptions: 1. Every patient has a unique manifestation of disease and interaction between disease, treatment and quality of life. 2. There are no clearly defined and accepted rules to dictate when surgery is the appropriate therapeutic choice, but there are principles that guide this decision. 3. It is not possible to know a priori what level of IOP will be needed to substantially slow or halt glaucoma and preserve quality of life; 4. IOP lowering should provide risk reduction for the development or progression of glaucoma and is not, by itself, the goal of therapy.
D086 TRABECULECTOMY
D. Anderson
Los Angeles, CA, USA
1. Laser trabeculoplasty (LT) with, diode, or frequency doubled Q-switched Nd:YAG are effective methods to lower IOP. The principal indication for laser trabeculoplasty remains the failure of medical therapy to sustain acceptable IOP levels in adult eyes with POAG or intolerance of medical therapy. However, in appropriate cases LT may be used as a primary therapy. 3. Although IOP lowering after LTP tends to wane with time, it may produce statistically significant IOP reduction in phakic eyes for up to several years. Comment: LTP often is effective in pseudophakic eyes for up to several years. 4. Postoperative monitoring of IOP and follow up treatment of intraocular pressure spikes is appropriate. Comment: IOP spikes tend to occur within the first few postoperative hours. 5. Use of adjunctive antifibrosis agent should be considered in most patients undergoing trabeculectomy and should be titrated against the estimated risk of postoperative scar formation and estimated risk for postoperative complications. Comment: Although some patients may have a successful result without adjunctive antifibrosis use, there is no systematic method for identifying these patients. Different antifibrotic agents may be associated with different risks and benefits. MMC may be a more effective adjunct than SFU but is associated greater complications. Comment: A large antifibrotic treatment area is desirable to diffuse non-cystic blebs with a lower risk of discomfort and leakage. Comment: Complications related to the use of antifibrosis agents are usually related to excessive scar formation, which result in postoperative IOP spikes. 7. Use of adjunctive antifibrosis agents is effective in reducing postoperative IOP spikes. 8. Adjunctive antifibrosis agents may be used intraoperatively or postoperatively. 9. Pars plana positioning of a GDD should be considered in patients with significant IOP spikes. 10. The extent and location of damage may alter the threshold for intervention of these eyes is advisable.

D087 THE FUTURE OF WOUND MODULATION
F. Lakhani
London, United Kingdom
More recently we have better understood the healing response and have been able to manipulate this response by modulating the cell cycle, growth factors, extracellular matrix/ cell relationships, and inflammation. This has led to healing after surgery that results in tissues with a much more normal morphology. This will enable us to achieve long term low IOPs associated with minimal long term glaucoma progression Beyond this, the extent and location of damage may alter the threshold for surgery. Patients with advanced damage or damaging threatening central vision may require lower IOP than those with early disease.

D088 TRABECULOCECTOMY
J.M. Liebman
New York, NY, USA
1. Incisional surgery for glaucoma is indicated when medical therapy and/or laser fail to sufficiently lower IOP or the patient does not have access to, or cannot comply with, other effective methods to lower IOP. The principal indication for laser trabeculoplasty is to lower the threshold to consider surgery. It is not clear that it is a risk factor for threat to vision. Comment: Family history of blindness from glaucoma is not a known risk factor for vision loss, but should be considered in postoperative observation. 8. Primary surgery may be indicated on the basis of socioeconomic or logistic constraints. Comment: There is insufficient evidence to recommend primary surgery in all patients. 9. Patients who are unable or unwilling to use their medical therapy as prescribed represent failures of treatment efficacy and may need surgery to achieve consistent IOP reduction, even when isolated IOP measurements appear normal. 10. The extent and location of damage may alter the threshold for surgery. Patients with advanced damage or damaging threatening central vision may require lower IOP than those with early disease.

D089 HOW DOES NON PENETRATING FILTERING SURGERY WORK
T. Shaarawy
Geneva, Switzerland
Objective: The presentation focuses on evidence based knowledge as well as current hypothesis on mechanisms of function of non penetrating filtering surgeries (NPPFS).
Main message: There are several points of interest when studying the mechanisms of function of non penetrating surgeries. Namely the removal of the inner wall of SC together with adjacent trabecular meshwork will create an aqueous flow through the trabecular meshwork membrane (TDM), the aqueous resorption after its passage through the TDM, and the SC drained by vescocanalicular injection.
Conclusions: NPPFS targets the site of maximal obstruction to aqueous outflow, namely the inner wall of Schlemm’s canal and the Juxtaglaucomatous trabeculum. The TDM offers effective methods to lower IOP. 2. The principal indication for laser trabeculoplasty remains the failure of medical therapy to sustain acceptable IOP levels in adult eyes with POAG or intolerance of medical therapy. However, in appropriate cases LT may be used as a primary therapy. 3. Although IOP lowering after LTP tends to wane with time, it may produce statistically significant IOP reduction in phakic eyes for up to several years. Comment: LTP often is effective in pseudophakic eyes for up to several years. 4. Postoperative monitoring of IOP and follow up treatment of intraocular pressure spikes is appropriate. Comment: IOP spikes tend to occur within the first few postoperative hours. 5. Use of adjunctive antifibrosis agent should be considered in most patients undergoing trabeculectomy and should be titrated against the estimated risk of postoperative scar formation and estimated risk for postoperative complications. Comment: Although some patients may have a successful result without adjunctive antifibrosis use, there is no systematic method for identifying these patients. Different antifibrotic agents may be associated with different risks and benefits. MMC may be a more effective adjunct than SFU but is associated greater complications. Comment: A large antifibrotic treatment area is desirable to diffuse non-cystic blebs with a lower risk of discomfort and leakage. Comment: Complications related to the use of antifibrosis agents are usually related to excessive scar formation, which result in postoperative IOP spikes. 7. Use of adjunctive antifibrosis agents is effective in reducing postoperative IOP spikes. 8. Adjunctive antifibrosis agents may be used intraoperatively or postoperatively. 9. Pars plana positioning of a GDD should be considered in patients with significant IOP spikes. 10. The extent and location of damage may alter the threshold for intervention of these eyes is advisable.

D090 NON PENETRATING GLAUCOMA DRAINAGE SURGERY (NPDDS)
G. Carassa
Milano, Italy
1. Lower IOP can be achieved with trabeculectomy than with NPDDS. 2. Short-term complications associated with NPDDS may be fewer and less severe. 3. NPDDS is technically more challenging, with a longer operative time. Comment: Both procedures may require postoperative intervention.

D091 COMPARISON OF TRABECULECTOMY VERSUS NONPENETRATING GLAUCOMA DRAINAGE SURGERY (NPDDS)
I. Goldberg
Sydney, Australia
1. A combined procedure is usually indicated when surgery for intraocular pressure (IOP) lowering is appropriate for a visually significant cataract is also present. Comment: Patients with glaucoma who are undergoing cataract do not necessarily require combined surgery. To avoid the complications associated with increased postoperative IOP, however, combined procedures should be considered in those patients on multiple medications or with advanced glaucomatous optic neuropathy. 2. The indication for combined surgery in an individual patient should take into account the level of desired IOP control after surgery. 3. The use of adjunctive antifibrosis agents should be considered in most patients undergoing trabeculectomy and should be titrated against the estimated risk of postoperative scar formation and estimated risk for postoperative complications. Comment: Although some patients may have a successful result without adjunctive antifibrosis use, there is no systematic method for identifying these patients. Different antifibrotic agents may be associated with different risks and benefits. MMC may be a more effective adjunct than SFU but is associated greater complications. Comment: A large antifibrotic treatment area is desirable to diffuse non-cystic blebs with a lower risk of discomfort and leakage. Comment: Complications related to the use of antifibrosis agents are usually related to excessive scar formation, which result in postoperative IOP spikes. 7. Use of adjunctive antifibrosis agents is effective in reducing postoperative IOP spikes. 8. Adjunctive antifibrosis agents may be used intraoperatively or postoperatively. 9. Pars plana positioning of a GDD should be considered in patients with significant IOP spikes. 10. The extent and location of damage may alter the threshold for intervention of these eyes is advisable.

D092 COMBINED CATARACT AND GLAUCOMA SURGERY
G.A. Coffin
Portland, OR, USA
1. A combined procedure is usually indicated when surgery for intraocular pressure (IOP) lowering is appropriate for a visually significant cataract is also present. Comment: Patients with glaucoma who are undergoing cataract do not necessarily require combined surgery. To avoid the complications associated with increased postoperative IOP, however, combined procedures should be considered in those patients on multiple medications or with advanced glaucomatous optic neuropathy. 2. The indication for combined surgery in an individual patient should take into account the level of desired IOP control after surgery. 3. The use of adjunctive antifibrosis agents should be considered in most patients undergoing trabeculectomy and should be titrated against the estimated risk of postoperative scar formation and estimated risk for postoperative complications. Comment: Although some patients may have a successful result without adjunctive antifibrosis use, there is no systematic method for identifying these patients. Different antifibrotic agents may be associated with different risks and benefits. MMC may be a more effective adjunct than SFU but is associated greater complications. Comment: A large antifibrotic treatment area is desirable to diffuse non-cystic blebs with a lower risk of discomfort and leakage. Comment: Complications related to the use of antifibrosis agents are usually related to excessive scar formation, which result in postoperative IOP spikes. 7. Use of adjunctive antifibrosis agents is effective in reducing postoperative IOP spikes. 8. Adjunctive antifibrosis agents may be used intraoperatively or postoperatively. 9. Pars plana positioning of a GDD should be considered in patients with significant IOP spikes. 10. The extent and location of damage may alter the threshold for intervention of these eyes is advisable.

D093 GLAUCOMA DRAINAGE DEVICES (GDD)
A.L. Coleman
Los Angeles, CA, USA
1. Glaucoma drainage devices are indicated when trabeculectomy is unlikely to be successful or because of socioeconomic or logistical issues. Comment: In some patients, GDDs should be considered for socioeconomic or logistic issues relating to safety, follow up care, etc. 2. The restriction of flow of aqueous humor from the eye is important in the physiology of immediate postoperative hypotony. Comment: GDDs that do not have mechanisms to restrict aqueous flow require a suture ligation or internal stent or other flow restricting mechanism. 3. In general, larger surface areas of the plate are associated with lower IOP. 4. Scar formation around the plate is the main issue with the term above-the-corneal level. Comment: Antifibrotic agents have not been shown to improve long-term success when used proactively or postoperatively. 5. Pars plana positioning of a GDD should be considered in a patient with a prior pars plana vitrectomy or in patient in whom a tube cannot be safely inserted into the anterior chamber. 6. The preponderance of evidence supports that a tube that drains to a posterior reservoir. Comment:Anterior draining devices that drain to a anterior reservoir. One should not extrapolate data from posterior drainage to anterior drainage devices.
1. Trabeculectomy with MMC is less expensive and requires less conjunctival dissection than GDD surgery. Comment: Cost of GDDs vary significantly throughout the world. 2. With increased conjunctival scarring, the success of MMC trabeculectomy is reduced. GDD surgery should be considered in patients with failed MMC trabeculectomy. 3. In general, lower IOP can be achieved with MMC trabeculectomy compared with GDD, but good clinical outcomes can be achieved in a majority of cases. There is currently no prospective randomized comparison between MMC trabeculectomy and GDD. To adequately compare MMC trabeculectomy with GDD, comparable patient populations are required. 4. Bleb related complications are less common after trabeculectomy with MMC. However, MMC surgery introduces a distinct set of complications including tube erosion or plate erosion, endothelial decompensation and stenosis. GDD surgery should be considered in patients at high risk of MMC-related postoperative complications. They include previous glaucoma surgery, chronic angle disease, chronic lens wear, and a history of blebitis or bleb-related endophthalmitis.

D095 CYCLODESTRUCTION
D.S.C Lam
Hong Kong, China

1. Of the cyclodestructive procedures, laser diode cyclophotocoagulation, with the General Laser Systems, is the procedure of choice for refractory glaucoma when trabeculectomy and drainage implants have a high probability for failure or have high risk of surgical complications. 2. Transcatheter cyclophotocoagulation may be considered when the maximally dilated corneal incision for trabeculectomy or drainage implant surgery is not possible due to resource limitations. 3. Prior to transscleral cyclophotocoagulation treatment, transillumination of the globe to reveal the location of the iris root may be useful, especially in morphologically abnormal eyes. 4. Post-operative treatment consists of topical steroids and cyclosporine is suggested to minimize post-operative complications and discomfort. Comment: The effectiveness of treatment should be assessed after 3-4 weeks, at which time re-treatment may be considered. Comment: Less intense laser therapy on a repeated basis rather than a single high dose treatment is suggested to minimize complications of treatment.

D096 COMPARISON OF GLAUCOMA DRAINAGE DEVICES VS CYCLODESTRUCTIVE TREATMENT PROCEDURES
K. Singh
Stanford, CA, USA

1. Mechanism of action: a. Glaucoma drainage Devices (GDD) increase aqueous humor outflow. b. Cyclodestructive procedures reduce aqueous production. 2. GDD implantation requires greater surgical training and is a more extensive procedure than cyclodestruction. 3. GDD implantation requires greater postoperative care than cyclodestruction. 4. GDD implantation should be performed in an operating room while cyclodestruction can be performed in the office, minor surgery area or in the operating room. 5. The marginal cost of GDD surgery is greater than cyclodestruction, but the cost of cyclodestruction related to the purchase of the device used for the procedure may be greater than that with GDD implantation. 6. Preoperative visual acuity may impact which of these two treatment modalities are preferred. All other things being equal, GDDs are more commonly used for patients with better visual acuity and/or visual potential relative to cyclodestructive procedures. Strong evidence in support of this practice is not currently available.

10.30 – 12.00 am.

D097 VISCOSCANALOSTOMY
G. Carassa
Milano, Italy

Viscoscanalostomy is a non-penetrating glaucoma operation that was devised to restore a normal outflow facility through the trabecular meshwork. Recent studies demonstrated that viscoscanalostomy produces specific modifications in the wall of Schlemm's canal with leeks. This procedure produces a scleral resistance set at the target pressure and uses MMC to inhibit the formation of additional resistance.

D098 DEEP SCLERECTOMY
A. Marcouard
Lausanne, Switzerland

Objective: Deep sclerectomy was developed in order to decrease the immediate post-operative complications of filtering surgery. Main message: With 15 years of experience, the following principles have been achieved: 1. Unanimous recognition of decrease in the number and severity of post-operative complications. 2. Similar IOP reduction if the surgery and the follow-up are correctly performed. 3. Lower risk of complications when compared with a conventional incision. Conclusions: Deep sclerectomy offers similar results in terms of intraocular pressure as the classical trabeculectomy with a reduced number of post-operative complications and surgical outcomes. The size of the subconjunctival bleb leading to less post-operative complications such as bleb discharge, bleb leak and bleb related infections.
D101 MANAGEMENT OF SMALL PUPILS
N. Pfeiffer, B. Dick, J. Wahl, A. Ahmadov
Mainz, Germany
Objective: To demonstrate methods how to deal with small pupils in glaucoma eyes undergoing cataract surgery. Many eyes with glaucoma have smaller than normal pupils. These include eyes with prior or present miotic therapy, pseudoxfoliation and many other secondary glaucomas. We demonstrate different methods to overcome this challenge in coexisting cataract necessitating cataract surgery. Any miotic therapy is discontinued. Preoperative dilatation is performed with adrenergics and parasympatholytics. Intraoperative miotic therapy is administered. Any posterior synechiae are gently detacted using viscoclastics. Often the inner margin of the pupil can be stripped off fibrosed tissue allowing the pupil to dilate further. Additional stretching of the pupil in opposite directions dilates the sphincter muscle. Iris hooks have the advantage of keeping the pupil wide but need to be introduced at the expense of time and possibly release of fibrin. Iridotomy and resuturing of the iris is rarely necessary. Using these methods cataract surgery is possible in virtually all glaucoma eyes.

D102 ZONULAR LAXITY/DEHISENCE
I.K. Ahmad
Mississauga, Canada
Objective: To review latest techniques and devices in the management of cataract with zonular instability or large (>4 hrs) zonular dialysis with 9-0 polypropylene scleral sutures; 6. eliminate progressive zonulopathy; 4. Iris/Capsule Retractors and the Capsular Tension Segment: 5. Specialized techniques and/or implants; 2. Phaco technique should be a low-flow, low-volume, supracapsular approach with low flow to 8-12 mm Hg. The conjunctiva is closed with a series of buried mattress sutures, and thereafter was stable throughout follow up. The mean of the HVF MD improved about 4 dB (from -13 to -9) after cataract removal and thereafter was stable throughout follow up. The PSD (5dB) was unchanged throughout follow up. Very few cases of late hypotony were encountered. Conclusions: The technique of using a visco-lytic incision, intraoperative IOP adjustment, and MMC application to inhibit the formation of additional resistance, yielded long-term pressure control in the target range and minimized the risk of hypotony.

D104 COMBINED CATARACT AND GLAUCOMA SURGERY WITH MMC
P. Palingan, K. Iriki
Miami, FL, USA
Objective: To illustrate a surgical strategy for obtaining long-term pressure control in the target pressure range. Technique: We will illustrate our technique for performing a 2-site FCE + PC IOL and MMC filtering procedure that features a valve-like incision incision and intraoperative adjustment of the scleral flap resistance. The technique begins with a temporal clear corneal phacoemulsification and instrumented as needed, followed by viscoelastic injection and placed into the anterior chamber. The 3-mm two-hand incision is made at 12 o'clock of the back of the limbal umbilic. MMC (0.4 mg/ml) is applied for 5 minutes with three 6x 4 mm very thin sponges, cut from the side of a Mediopont spong. The sponges are removed and copious irrigation performed. A Crescent blade is used to tunnel 2 mm forward from the base of the groove, and the anterior chamber entered with a Kerastrate A. 0.75 mm Kelly Decamet’s punch is used to perform a posterior lip sclerotomy, adjusted to produce a valve-like incision corresponding to an equilibrium pressure of 4-6 mm Hg. This is tested by instilling BSS through a paracentesis, watching the flow to equilibrate, and estimating the IOP by pressing on the cornea with a 30g sponge. Two or more 10-0 nylon sutures are then placed to adjust the IOP at equilibrium flow to 8-12 mm Hg. The conjunctiva is closed with a series of buried mattress sutures, taking care to build out tension along the limbus and to take vertical bites in the sclera that will not later claw through either sclera or conjunctiva. Results: The mean IOP in 265 eyes operated upon with either ECCE, 1-site or the current 2-site procedure was reduced from 23 to 11 mm Hg during up to 10 years of follow up. The mean IOP at the 1st postoperative visit was improved about 4 dB (from 13 to 9) after cataract removal and thereafter was stable throughout follow up. The PSD (5dB) was unchanged throughout follow up. Very few cases of late hypotony were encountered. Conclusions: Combination of using a visco-lytic incision, intraoperative IOP adjustment, and MMC application to inhibit the formation of additional resistance, yielded long-term pressure control in the target range and minimized the risk of hypotony.

D105 GLAUCOMA DRAINAGE DEVICE AND CATARACT SURGERY
D.L. Buda
Miami, FL, USA
Objective: To describe the technique and outcome of combined cataract and glaucoma drainage device surgery. Main message: An isolated combined cataract surgery and trabeculectomy has been the procedure of choice in patients who require both cataract and glaucoma surgery. There may be times when performing a glaucoma drainage implant at the time of cataract surgery can be advantageous. Exceptional patients who have small pupils or who have undergone prior trabeculectomy surgery in whom trabeculotomy is expected to have poor success rates (uveitis, ICE syndrome, etc.), and those in whom trabeculotomy may be contraindicated (chronic blepharitis).

D106 MOLECULAR GENETICS OF PRIMARY CONGENITAL GLAUCOMA: THE INDIAN SCENARIO
G. Chatterjee, K. Kaushal, A. Manda1, R. Thomas, I. Kaur, S.E. Hasnain, K. Ray, P.P. Majumder, D. Balasubramanian
Hyderabad, India, Kolkata, India
Objective: To understand the underlying molecular mechanisms in primary congenital glaucoma in the background of CYP1B1 mutations and their role in disease pathogenesis with special reference to the Indian subcontinent.
Main message: Primary congenital glaucoma (PCG) with a predominantly autosomal recessive mode of inheritance exhibits a high prevalence among the inbred populations (one in 1250 among the Slovakian gypsy and one in 2500 among Saudi Arabians). It affects around one in 3300 live births in the Indian state of Andhra Pradesh and consanguinity is one of the major risk factors towards disease predisposition. Three chromosomal loci have been mapped for PCG on 2p21 (GLC3A), 1p36 (GLC3B) and 14q24.3 (GLC3C), of which the human cytochrome p450 gene CYP1B1 on GLC3A has been characterized. The frequency and spectrum of CYP1B1 mutations vary widely across different ethnic groups and populations. In the Indian scenario, CYP1B1 accounts for 40% of all PCG cases with variable penetrance and the Arg368. It is the most common mutant allele. There is also an evidence of Myocilin (MYOC; another glaucoma causing gene, particularly in juvenile and adult-onset PDAG) being implicated in PDAG. Some of the CYP1B1 heterozygotes express no overt genetic inheritance should be a low-flow, low-volume, supracapsular approach +/- vitreous management as required; 3. Capsular Tension Ring (CTR) should be used within an intact capsular bag for mild/moderate zonular weakness. Prophylactic use is questionable. Keep in mind, CTRs are useful intraoperative and postoperative zonular support devices, but do not rectify a dislocated cataract nor eliminate hypotony. 4. Itra/Capsul Retractors and the Capsular Tension Segment (CTS) are useful and versatile for intraoperative zonular support of any severity; 5. Cataract patients with IOLs, such as modified-CTR, or CTS should be used with profound zonular instability or large (+>4 hrs) zonulal dialysis with 9-0 polypropylene scleral sutures; 6. Postoperative vigilance is critical to treat anterior capsular contraction syndrome (i.e., NoYAG anterior capsule relaxing incisions) and/or IOL decentration (suture repositioning).
DIDACTIC PROGRAM

Saturday, July 9, 2005

In days gone by . . . the words “I understand nothing” meant merely ignorance on the part of him who uttered them; yet, at present they bring great honour. One has only to declare with an open air and uppishly: “I do not understand religion; I understand nothing in Russia; I understand nothing in art” – and at once one is lifted to lofty heights.

And this is all the more advantageous if one, in fact, understands nothing.

F.M. Dostoyevsky
2.00 – 3.00 pm.
GS03 WOUND HEALING
P. Khaw
London, United Kingdom

Objective: To review reasons for healing modulation in most patients undergoing surgery and current and possible future anti-scarring therapies and techniques.

Main message: 1. Lower pressure targets are required after surgery to achieve minimal glaucoma progression; 2. Antiscarring therapies can help achieve these targets relatively safely; 3. Better treatments will be available in the future.

Conclusions: 1. Recent clinical trials provide strong evidence that pressures in the low teens are associated with minimal progression. In our recent More Flow study no patient who had pressures less than 14 mmHg on all visits experienced glaucomatous progression over a period up to eight years. The major determinant of the long term pressures after surgery is the scarring response of the eye; 2. Advances in antiscarring therapy have improved the success of surgery and improvements in surgical technique have reduced complications; 3. Further advances in therapies and techniques should enable lower long term pressures with minimal complications.

GS04 ANTERIOR SEGMENT CHANGES AFTER FILTERING SURGERY
N.L. Wang
Beijing, China

Objective: To summarize the anterior segment changes after trabeculectomy.

Main message: The use of antimetabolites in trabeculectomy might lead to the development of thin and avascular blebs. Histological analysis of thin blebs excised demonstrated that this type of neuropathy could be stabilized by treatment. The objective is to further understand this pathophysiological mechanism by which angle closure glaucoma occurs and also progresses.

Friday, July 8, 2005

2.15 – 3.15 pm.
GS01 GLAUCOMA: A SOCIETAL PERSPECTIVE
A.L. Coleman
Los Angeles, CA, USA

Purpose: To discuss the importance of a societal perspective in decision-making related to the diagnosis and treatment of glaucoma.

Methods: The presentation will consider rates of blindness in individuals with glaucoma, assessments of the economic effects of glaucoma, and the impact of glaucoma on quality of life.

Conclusion: When making decisions about resource allocation for screening and treatment of glaucoma, it is imperative to take a public-health perspective on undiagnosed disease and a societal perspective on the economic and human costs of the disease.

GS02 PATHOGENESIS AND PROGRESSION OF PRIMARY ANGLE CLOSURE GLAUCOMA
R. Sihota
New Delhi, India

Primary angle closure glaucoma is a complex disease in which anatomical factors and physiological factors both play an important part. Anatomically a PACG eye has been known to be shorter, with a thicker lens and shallower anterior chamber. Physiologically it has been thought that a mid dilated position of the pupil during stress, in twilight etc allows the occurrence of a relative pupillary block and angle closure. However, the clinical manifestations of PACG are not uniform, and why the different subtypes of PACG occur is still not clear. Biometric studies have shown that eyes having acute attacks of PACG had the shallowest AC and the thickest lenses, chronic PACG eyes were similar, but less deviated from normal, and subacute PACG eyes were nearest in anatomical structure to control eyes. A study of the UBM parameters in the different subtypes showed that the iris thickness was least in acute PACG eyes, and the angle recess was narrowest. We have shown that a Valvular mechanism of the anterior chamber IOP, and could be a further physiological mechanism by which angle closure glaucoma occurs and also progresses.

GS05 NORMAL-TENSION GLAUCOMA: AN ENIGMA TO ALL OF US
T. Yamamoto
Gifu-shi, Japan

Objective: Much attention is being paid recently to normal-tension glaucoma (NTG). This interest is driven by three main factors: a high prevalence rate, its usefulness as a natural model of glaucomatous optic neuropathy lacking evidence of high IOP, and the recent discovery that this type of neuropathy could be stabilized by treatment. The objective is to show our current understanding of this enigmatic condition.

Main message: NTG is the most prevalent subtype of glaucomas in Japanese aged 40 years or older, having a prevalence of 3.6%. The prevalence increases rapidly with age, reaching 7% in those aged 70 years or older. We still do not fully understand the pathogenesis of NTG or the best method for the management of the condition. However, many reports have concluded that ocular hypotensive therapy is the treatment of choice and that compliance is a key factor for successful treatment; patients should be assisted to improve their skill to instil drops, and instructed on the need to strictly meet the treatment. Some times psychotherapy might be required. Subsequent monitoring of the surgery and antiglaucoma medication’s hypotensive effect must include a daily ocular pressure curve, as in order to decrease defect progression risk, besides attaining the target IOP, the pressure should be controlled to prevent peaks during the day. Other factors should be considered in advanced glaucomas, besides IOP, that may cause structural or functional deterioration, among them thin corneas, nocturnal arterial hypertension (dippers), anemias and blood dyscrasias, sleep apnea, vasosasms (migraines, Raynaud, variant angina) compliance, cataracts, maculopathy.

Conclusions: In advanced glaucomas, SAP for perimeter controls is preferable to SWAP or FDT. Various algorithms have been developed in SAP to identify defect progression. In temporal visual fields with a central or paracentral loss, defects confirmed to have progressed should be made with 10º programs (macular) instead of 30º programs. In these patients the presence of technical artifacts such as poor cooperation, loss of fixation and fatigue are more frequent than in initial and moderate glaucomas, therefore increasing the long-term fluctuation and compounding the control of the lesion stability or progression. Patients with a central retinal may present the wipe-out phenomenon after trabeculectomy. Reducing IOP in advanced-glaucoma patients is a priority to decrease optic nerve and visual field deterioration. Trabeculectomy is the most effective, long-lasting and safest treatment to reduce intraocular pressure. Occasionally additional post-operative medical treatment is required to further lower IOP and decrease defect progression risk. According to AGIS, intracocular pressure lowering ALT or trabeculectomy reduces the risk of established advanced glaucoma progression when intraocular pressure is consistently controlled below 18 mmHg. In terminal glaucomas, home accidents, tripping, falls, burns, as well as depression, are more frequent than in the general population of the elderly. Glaucoma progression occurs in advanced glaucomas, rather than when progression occurs in early and moderate glaucomas.

Saturday, July 9, 2005

2.00 – 3.00 pm.
GS06 PERIMETRY AFTER SURGERY IN LATE-STAGE GLAUCOMA.
J.F. Casalino, P. Lavena
Buenos Aires, Argentina

Objective: The purpose of this presentation is to review information about visual field evolution after trabeculectomy in advanced glaucoma patients.

Main message: Patients with late diagnosis of glaucoma, or whose structural and functional defect has progressed in spite of early diagnosis and treatment, may reach an advanced glaucoma stage. The IOP target in advanced-glaucoma patients should be lower than in early and moderate glaucoma. Advanced-glaucoma patients need combined medical or filtering surgery with or without antifibrotic agents to attain a low IOP: 12 mmHg or less, invariable during the course of the day. Advanced-glaucoma follow-up is more complex than with SAP or with optical coherence tomography. Minor changes in visual field are considered as being caused by early secondary effects such as photophobia, squeezing of the lid or subjective discomfort, or even by movement of the eye. The deterioration may cause a marked central vision loss. Progression occurs in a certain percentage of operated advanced glaucomas even with IOP controlled within normal values. Most of these patients are elderly persons with difficulties to instil ophthalmic drops. Compliance is a key factor for successful treatment; patients should be assisted to improve their skills to instil drops, and instructed on the need to strictly meet the treatment. Some times psychotherapy might be required. Subsequent monitoring of the surgery and antiglaucoma medication’s hypotensive effect must include a daily ocular pressure curve, as in order to decrease defect progression risk, besides attaining the target IOP, the pressure should be controlled to prevent peaks during the day. Other factors should be considered in advanced glaucomas, besides IOP, that may cause structural or functional deterioration, among them thin corneas, nocturnal arterial hypertension (dippers), anemias and blood dyscrasias, sleep apnea, vasosasms (migraines, Raynaud, variant angina) compliance, cataracts, maculopathy.

Conclusions: In advanced glaucomas, SAP for perimeter controls is preferable to SWAP or FDT. Various algorithms have been developed in SAP to identify defect progression. In temporal visual fields with a central or paracentral loss, defects confirmed to have progressed should be made with 10º programs (macular) instead of 30º programs. In these patients the presence of technical artifacts such as poor cooperation, loss of fixation and fatigue are more frequent than in initial and moderate glaucomas, therefore increasing the long-term fluctuation and compounding the control of the lesion stability or progression. Patients with a central retinal may present the wipe-out phenomenon after trabeculectomy. Reducing IOP in advanced-glaucoma patients is a priority to decrease optic nerve and visual field deterioration. Trabeculectomy is the most effective, long-lasting and safest treatment to reduce intraocular pressure. Occasionally additional post-operative medical treatment is required to further lower IOP and decrease defect progression risk. According to AGIS, intracocular pressure lowering ALT or trabeculectomy reduces the risk of established advanced glaucoma progression when intraocular pressure is consistently controlled below 18 mmHg. In terminal glaucomas, home accidents, tripping, falls, burns, as well as depression, are more frequent than in the general population of the elderly. Glaucoma progression occurs in advanced glaucomas, rather than when progression occurs in early and moderate glaucomas.

www.globalaigs.org
Objective: To review recent advances in imaging instruments for the diagnosis and man-
agement of glaucoma. 

Introduction: Dr. Linda Zangwill.

HRT – recent advances: Dr. Stefanos Migliore. 

The recent addition of a normative database from which location dependent normative thickness values are derived, has further in-
creased the value of this technology for the glaucoma patient. The relatively new Stratus Ocular coherence tomography (OCT) was originally developed and marketed for retina disease. However, with its ability to identify the retinal nerve fiber layer (RNFL) borders, and hence to provide accurate measurements of this layer, the value of OCT for glaucoma diagnosis and monitoring was soon realized. The recent edition of a normative database, from which location dependent normative thickness values are derived, has further in-
creased the value of this technology for the glaucoma patient. The recent Stratus OCT with its new software will be soon be available that includes a ‘reference plane free’ longitudinal evaluation.

Summary and conclusion: Dr. Linda Zangwill.

C003 ADVANCED OPTIC NERVE IMAGING (HRT, GDx, OCT) – PART 1

H.G. Lemij (chair) 1, R.D. Fechtner 2, F.A. Medeiros3, C.F. Burgoyne4, M.M. Iester 5, R. Burk 6,

Objective: To review recent advancements in utilizing discriminant function analyses and/or regression analyses to identify normal optic discs from abnormal and borderline ones with a high degree of discrimination. HRT II also provides several automated analyses of change over time based on trend analysis of the global disc or of sectors of the disc, and on the topographic change analysis which does not require the drawing of the contour line around the disc border. Moreover new software will be soon available that includes a ‘reference plane free’ longitudinal evaluation.

GDX – recent advances: Dr. David Greenfield.

The GDX-vcc generates RNFL thickness assessments by neutralizing eye-specific corneal polarization axis and magnitude using the concept of the macula as an intracocular pola-
rization component with wider commercial iterations, the GDX-vcc significantly improves the structure-function relation in glaucoma, agreement with other imaging technolo-
gies, and discriminating power for glaucoma detection. Prospective studies have demon-
strated that GDX-vcc measurements in the GDX-vcc may predict progression in glaucoma sus-
pects. Recent evidence suggests that atypical patterns of peripapillary birefringence have been observed in a subset of normal and glaucomatous eyes and commonly present as alternating peripapillary circularfemtional bands of low and high retardation around the optic nerve head. A modification of variable corneal compensation may reduce the preva-
lence of such artifact.

OCT – recent advances: Dr. Eytan Blumenthal.

This course will cover the theory and development of optical coherence tomography (OCT) in ocular diseases. OCT is an optical imaging technique that uses light interferometry to produce high-resolution images of the retina in a non-invasive manner. OCT is based on the principles of interferometry, a branch of physics that deals with the interference of light waves. OCT has revolutionized the way we understand and manage ocular diseases such as glaucoma, diabetic retinopathy, and macular degeneration. In this course, we will discuss the basic principles of OCT, its clinical applications, and recent advances in OCT technology.

Introduction to course: Dr. Pamela Sample.

Electrophysiology in Glaucoma: Dr. S.L. Graham. 

The course will cover the theory and development of electrophysiological testing of visual function. A review of currently available methodology and results in patients with glaucoma will be given with emphasis on evidence based findings.

Experimental Glaucoma for Evaluating Visual Function: Dr. R. Harwerth. 

Animal models of ocular disorders provide unique information that can be applied to the diagnosis and treatment of patients. In most cases, however, the applicability of an exper-
imental model must be validated by comparisons to affected functions in patients. This presentation will describe the primate model of experimental glaucoma for use in clinical studies at the structure-function relationship for standard automated perimetry. Studies of alternative methods of psychophysical testing for glaucomatous visual field defects will also be described.

C004 HOW TO DETECT PROGRESSION AND USE IT TO MANAGE GLAUCOMA – PART 1

D.F. Garway-Heath (chair) 1, B.C. Chauhan2, L.M. Zangwill3, A. Hjal3

‘London, United Kingdom, 2Halifax, Canada, 3La Jolla, CA, USA, Malmö, Sweden

Objective: The purpose of this course is to review methods to detect progression of glaucoma and discuss how these can be implemented practically in the routine manage-
ment of patients.

Main message: The objective in managing patients with glaucoma is to prevent functional visual impairment during their lifetime. To do this, one needs to know the stage of disease and the rate of progression. The ideal is to know the rate of progression of all our patients, but in practice, we can only identify the progression events (the ‘safety net’ approach). The course will discuss evidence from the literature (clinical trial and hospital-based data) for progression risk factors. Risk factor assessment approaches for identifying progression (rate- and event-
based approaches) and review published methods for detecting progression by analysis of visual field and imaging data. Barriers (such as variability, data quality, and lack of hard-
ware and software support) to detecting progression will be considered, leading to a discussion of a practical approach in the real world.

Conclusions: 1. Measuring rates of progression is optimal for following patient progress. 2. Risk profiling identifies patients at highest risk of functional visual impairment; 2. Re-
sources should be concentrated on those at highest risk; 3. Both visual function and imaging measurements are needed to identify all progressing patients; 4. Greater availabil-
ity of hardware and software support is needed to make use of current technology.

C005 THE ART OF WRITTEN AND ORAL PRESENTATIONS

L. Minckler (chair), R. Brickey.

‘Los Angeles, CA, USA, 2London, United Kingdom

Objective: To improve oral and written communications.

Message: Achieving success in publication, as in oral presentations, requires pre-planning and adherence to a logical sequence of thought. A thorough command of the subject in question and anticipating the interests, level of sophistication about the subject, and likely questions among members of the audience are particularly crucial to an effective oral presentation. Scientific writing and scientific presentations both profit from grammatically correct language, standard terminology and organization, and conciseness. The main goal is clear transmission of useful and valid information in palatable segments. Poten-
tial authors must review and adhere to specific format requirements of journals in which they wish to publish. Generally clinical vision journals require an abstract including from four to seven sections and text organization including an introduction, methods, results, a discussion, and references.

Conclusions: Authors or speakers describing clinical research data must acquire a basic understanding of study design and related biostatistical concepts to ensure that their analysis and conclusions about data are appropriate.

References:


C006 DESIGN, CONDUCT AND INTERPRETATION OF CLINICAL TRIALS: PEARLS AND PITFALLS


‘Stanford, CA, USA, 2Los Angeles, CA, USA, 3Baltimore, MD, USA, 4London, United Kingdom

The recent, randomized, multicenter, prospective clinical trial has become accepted by health care professionals as providing the highest quality of evidence in support of, or against, a particular hypothesis evaluating new or existing therapy. Over the past decade, several large, prospective multicenter randomized clinical trials have provided epidemiologic evidence to support so many of the decisions we make in glaucoma practice. While prospective multicenter randomized clinical trials have undoubtedly added to our understanding and influenced the treatment of glaucoma patients, all such studies are not created equal. Controlled or interpreted equally well. The potential for bias, misunderstanding and incorrect interpretation is by no means eliminated simply by conducting such a study. When per-
formed correctly, and with scientific integrity, the randomized clinical trial is unsurpassed in epidemiologic circles. In less than ideal circumstances, it may provide information that is no better than that from a lesser study design.

Purpose: To have experienced investigators present the pearls and pitfalls of clinical trials. Emphasis will be placed on the development of a hypothesis, study design, conduct and interpretation of findings. Concepts such as randomization, masking, bias and conflict of interest will be addressed. The presentation will be interactive with plenty of time for ques-
tions and comments from the audience.

C007 VISUAL DISABILITY, QUALITY OF LIFE, AND OUTCOMES


‘London, United Kingdom, 2Aberdeen, United Kingdom, 3Durham NC, USA, 4Miami, FL, USA, 5Philadelphia, PA, USA

Objective: To present an overview based on the clinical impact of glaucoma on patients’ ability to perform visual tasks, on their health-related quality of life, and on global and vision-specific functional outcomes.

Main message: Various different approaches have shown that there is a link between patients’ measurable visual function and their own perceptions about their visual ability. This link is not confined to patients with end-stage visual loss: subtle visual and visual morbidity may be caused not only by the disease process but also by the diagnosis and treatment of it. Glaucosa research and clinical practice need to concentrate more on measures and outcomes which are of relevance to the patient rather than merely of interest to the ophthalmologist.

C008 RISK FACTORS FOR THE DEVELOPMENT AND PROGRESSION OF GLAUCOMA

R. D. Fechun (chair), D.S. Friedman, S. Onell, T. Yamamoto.

‘Stevenville, TX, USA, 2Baltimore, MD, USA, 3Sydney, Australia, 4Gifu-shi, Japan

Objective: To review risk data from recent glaucoma clinical trials and the models of global risk assessment that may help identify patients at highest risk of progression. 

Main message: Cardiology has been modeling risk for 50 years. Studies have allowed the development of risk calculations and treatment decisions. The treatment of glaucoma has developed from large, prospective glaucoma trials, we are beginning to amass the data to allow us to use this information to calculate the impact of interventions and ask questions about impact on the patient means that we have to concentrate our resources on those at highest risk of functional visual impairment. To identify those at highest risk, it is necessary to know the rate of progression of all our patients, but in practice, we can only identify the progression events (the ‘safety net’ approach). The course will discuss evidence from the literature (clinical trial and hospital-based data) for progression risk factors. Risk factor assessment approaches for identifying progression (rate- and event-
based approaches) and review published methods for detecting progression by analysis of visual field and imaging data. Barriers (such as variability, data quality, and lack of hand-
C009 PROOF OF GANGLION CELL DEATH PREVENTION
L. Levin (chair), K.R.G. Martin, M. Schwartz

The goal of the course is to present and discuss technology aspects in teleglaucoma, cornerstones in successful telemedicine and cost-effectiveness of telemedicine applications. Telemedicine in ophthalmology, and especially in glaucoma care, becomes an increasing necessity. The availability of medical images and data from multiple peripheral units which we use for diagnosis and follow-up can be easily transferred from one site to another either on-line or off-line. In providing health services, telemedicine removes the limitation of distances both for the patient and the doctor. From the patient’s perspective, distance health care ideally means receiving expert services, consultation, and a second opinion in his/her neighborhood. Barriers to the introduction of telemedicine are often non-technical, such as personal and organization issues. Technology is not only the users adopt and apply it. The clinical and explicit goal of health system is to reduce costs by diminishing care that cannot be demonstrated to enhance the health of patients. Telemedicine offers nothing more than what can currently be done in the physician’s office but represents a change in the process of medical care. The advantages of new technologies either improve current health care process, or while performing as older methods, cost less. Considerable research will be necessary before we have good and thorough understanding of the effects and effectiveness of telemedicine in glaucoma care.

C010 TELEGLAUCOMA
A. Tuijnen (chair), G. Michelsoon

‘Oulu, Finland, ‘Erlangen, Germany

This course will discuss the approach to the patient with heritable glaucoma. Obtaining the family history and pedigree drawing will be discussed. The known glaucoma mutations will be reviewed. The promise of genetic testing for making a glaucoma diagnosis, determining disease course, screening and directing therapy will be reviewed.

C012 ADVANCED OPTIC NERVE IMAGING (HRT, GDx, OCT) – PART 2

Rotterdam, Netherlands, ‘Newark, NJ, USA, ‘La Jolla, CA, USA, ‘Geneva, Italy, ‘New Orleans, LA, USA, ‘Bielefeld, Germany, ‘Brooklyn NY, USA

This course is intended to provide a guide on how to incorporate the results of scanning laser tomography (feature in the Heidelberg Retina Tomograph), scanning laser polarimetry (commercially available in the GDx) and optical coherence tomography (OCT), optical coherence tomography into clinical practice. A review of existing evidence for the utility of these instruments for glaucoma diagnosis and evaluation of progression will be provided. Emphasis will be given to the interpretation of printouts and its use for glaucoma evaluation, according to the principles of evidence-based medicine. Several case presentations will be used to illustrate the main concepts.

C013 ADVANCES IN PSYCHOPHYSICAL TESTING FOR GLAUCOMA PATIENTS – PART 2
P.A. Sample (chair), J.G. Flanagan, R.S. Harwerth, C.A. Johnson

‘La Jolla, CA, USA, ‘Toronto, Canada, ‘Houston, TX, USA, ‘Portland, OR, USA

Introduction to course: Dr. Pamela Sample.


Standard automated perimetry (SAP) will be defined with particular reference to the levels of evidence available for commonly used instruments and testing strategies. Patient based variables such as the effect of media opacity, pupil size, learning, and fatigue, will be considered, along with instrument variables, including background luminance, target size and target type. Evidence on the reproducibility and variability of SAP will be presented. The ability of SAP to stage the disease and evidence of the sensitivity and specificity of different definitions of glaucoma will be discussed. Statistical methods for handling these data will be described. The ability of SAP to measure the disease process and the implications of recent clinical trials will be discussed.

Full-field ERG: Short-wavelength Automated Perimeter and Frequency Doubling Perimetry. Dr. C.A. Johnson.

This presentation will provide an overview of SWAP, both full threshold and SITA-SWAP, and FDT, both with the original device and the new Matrix. It will include the underlying basis for each test, optimization of test procedures, a brief history of evidence-based findings in glaucoma, and the advantages of SWAP in detection of early glaucoma.

Thursday, July 7, 2005

C014 HOW TO DETECT PROGRESSION AND USE IT TO MANAGE GLAUCOMA – PART 2
J.G. Flanagan (chair), B.C. Chauhan, I.M. Zangwill, A. Heijl

‘London, United Kingdom, ‘Halifax, Canada, ‘La Jolla, CA, USA, ‘Malmö, Sweden

Please refer to C004

C016 BLOOD FLOW IN GLAUCOMA
J. Flammer (chair), M. Araie, G.A. Cioffi, A. Harris, S.I. Orgül

‘Basel, Switzerland, ‘Tokyo, Japan, ‘Portland, OR, USA, ‘Indiana, IN, USA

The role of blood flow evaluation for glaucoma patients will be discussed. We will have the following presentations: 1. Blood flow assessment in glaucoma patients, Dr. Selim Orgül; 2. How can blood flow be measured in glaucoma patients?, Dr. Alan Harris; 3. Influence of applied medications on ocular blood flow, Dr. Makoto Araie; 4. Discussion and questions, Dr. Josef Flammer.

C017 THE ROLE OF OPTIC DISC PHOTOS IN GLAUCOMA MANAGEMENT
B. Jonas (chair), P.J. Arakisinen, J. Caprioli, P. Mitchell

‘Mainz, Germany, ‘Los Angeles, CA, USA, ‘Sydney, NSW, Australia

Objective: The objective of the course is to demonstrate the diagnostic value of histopathological features of the optic nerve head for the diagnosis of glaucoma, and the role of optic neuropathy.

叹息

Main message: Morphologic optic disc parameters which can be assessed by ophthalmoscopy or on optic disc photographs are size and shape of the optic disc, size, shape and pallor of the neuroretinal rim, size of the optic cup in relation to the area of the disc, configuration and depth of the cup, ratios of cup-disc diameter and cup-to-disc area, position of the exit of the central retinal vessel trunk on the lamina cribrosa surface, presence and location of splinter-shaped hemorrhages, occurrence, size, configuration and location of parafoveal choroidal atrophy, diffuse and/or focal decrease of the diameter of the retinal nerve fiber layer. Most important variables for the early detection of glaucomatous optic nerve damage are relative cup-to-disc ratio (shape ISNT-line), optic cup size in relation to optic disc size, diffusely or segmentally decreased visual field of the retinal nerve fiber layer, occurrence of localized retinal nerve fiber layer defects, and presence of disc hemorrhages.

Conclusions: These morphological parameters of the optic nerve head are helpful for the detection of glaucomatous optic neuropathy and for the detection of progression of glaucoma.

C018 VISUAL FIELDS IN ADVANCED GLAUCOMA
D.L. Buznak (chair), R.L. Stamper, M. Fingeret

‘Miami, FL, USA, ‘San Francisco, CA, USA, ‘Brooklyn, NY, USA

Objectives: To provide practical information on diagnosing glaucoma worsening in patients with severe glaucoma.

Main message: Once the visual field is severely damaged, it can be difficult to diagnose glaucoma worsening with visual fields. Visual criteria for worsening, such as AIGIS, CIGTS, Bregenzerwald criteria, and Hodag-Anderson-Prentice algorithms, do not perform well. New programs of the Humphrey perimeter such as Size V test objects, 10 or 6 degrees programs, or Goldmann perimeter, one can usually assess progression although there are no specific criteria to diagnose.

Conclusions: Visual fields can be used to follow advanced glaucoma but special programs needs to be employed and specific determination is more subjective than in early and moderate glaucoma.
2.00 – 2.45 pm.

C048 EXPERIMENTAL MODELS OF GLAUCOMA
J.D. Lindsey (chair) 1, J.A. Cliffer 2, R.B. Harwerth 3
1La Jolla, CA, USA, 2Portland, OR, USA, 3Houston, TX, USA

Investigation of the biological basis of glaucoma has been advanced by study of glaucoma models that allow experiments not possible in humans. In addition, these models facilitate testing of potential treatments to establish proof of principle for potential treatments prior to human testing. Because each of the models has strengths and limitations, the choice of model and the type of information that can be obtained are selected according to the problem to be addressed. This course will provide an overview of current experimental models of glaucoma. We will also discuss the potential uses of other (ocular) diseases, medication and allergies; 7. Cost-effectiveness.

C024 EXPERIMENTAL MODELS OF GLAUCOMA
J.D. Lindsey (chair) 1, J.A. Cliffer 2, R.B. Harwerth 3
1La Jolla, CA, USA, 2Portland, OR, USA, 3Houston, TX, USA

Natural history studies have provided clear answers as to the risk run by patients diagnosed with normal pressure glaucoma. As a consequence it is possible to move towards a rational approach for treatment. The presenters in this course on normal pressure glaucoma will do just that. Kruip will discuss the demographics of patients in the USA: few patients of glaucoma treatment therapy, 1. What factors will describe the goals of the therapy towards appropriate treatment. Kitazawa will discuss risk factors for progression in patients with normal pressure glaucoma. Alhara will look at non pressure lowering treatments. The management of patients with normal pressure glaucoma in his talk entitled neuroprotective therapy for normal tension glaucoma.

C026 CONGENITAL AND INFANTILE GLAUCOMA
P. Khaw (chair) 1, M.S. Jafar 2
1London, United Kingdom, 2Washington, DC, USA

Objective: Pediatric glaucoma is a rare and heterogeneous disease entity. Pearls in the diagnosis and management will be shared to help early diagnosis and treatment, and improve prognosis.

Main message: This course will overview important presenting signs and symptoms that help make early and accurate diagnosis of primary infantile glaucoma (Trabeculodygenesis) and secondary pediatric glaucoma. Tonometry in the awake and sedated child will be covered in depth. Management, be it surgical or medical, will be then discussed with special emphasis on clinical pearls that would, hopefully, improve the outcome. Gonioscopy and gonioscopic ab externo are the mainstay of pediatric glaucoma surgical intervention. Alternative procedures for refractory glaucoma will be also covered (Combined trabeculotomy-trabeculectomy, cyclo-ablation surgery, trabeculectomy with Mitomycin-C, etc...). The traditional treatment of glaucoma in children will set the stage for critical features that are unique to children.


C027 EXFOLIATION SYNDROME AND EXFOLIATIVE GLAUCOMA
R. Rich (chair) 1, A.G.P. Konstas 2, U. Schlötzer-Schrehardt 3
1New York, NY, USA, 2Thessaloniki, Greece, 3Erlangen, Germany

XFS in glaucoma cohorts is significantly higher than in age-matched non-glaucomatous populations. In persons with XFS, the risk of developing glaucoma is cumulative over time. Glaucoma in XFS has a more serious clinical course and worse prognosis than in primary open-angle glaucoma. There is a significantly higher frequency and severity of optic nerve damage at the time of diagnosis, worse visual field damage, poorer response to medication, more severe clinical course, and more frequent necessity for surgical intervention. Glaucomatous damage progresses more rapidly in patients with XFS and glaucoma than in patients with primary open-angle glaucoma. Persons with XFS are also predisposed to develop angle-closure glaucoma. Deposits of white material on the anterior lens surface are the most consistent and important diagnostic feature of XFS. The classic pattern consists of three distinct zones that become visible when the pupil is fully dilated. Whereas the classic pattern of manifest XFS has been often described, the early stages of beginning exfoliation have not been well defined. Next to the lens, exfoliation material is most prominent in the pupillary border. Pigment loss from the iris sphincter region and its deposition on posterior chamber structures is a hallmark of XFS. Just as the iris scrapes exfoliation material from the lens surface, the material on the lens causes rupture of iris pigment epithelial cells at the ruff and sphincter region with concomitant dispersion of pigment into the anterior chamber. Loss of pigment and its deposition throughout the anterior segment are reflected in iris sphincter region transillumination, loss of the pupillary ruff, increased trabecular meshwork pigmentation, and pigment deposition on the iris surface. Association with systemic disorders and blood flow abnormalities, other small animals, and primates. Questions answered include how each of these models may be used to advance basic understanding of glaucoma, and how rational model choice can facilitate the development of new glaucoma treatments. Finally, several recent advances obtained using various glaucoma models will be described to illustrate these principles.
**PIGMENT DISPERSION SYNDROME AND PIGMENTARY GLAUCOMA**

Pigment dispersion syndrome (PDS) is an autosomal dominant disorder which usually has its onset in the third decade and begins to regress toward the end of the fourth decade, concomitant with the onset of presbyopia. Myopia predisposes to the development of the phenotypic expression of PDS (80% are myopes, 20% are emmetropes, and hyperopia is rare). The mean degree of myopia in patients with pigmentary glaucoma is greater than that in patients with PDS and ocular hypertension and the age of onset of glaucoma is inversely proportional to the degree of myopia. The pathophysiologic mechanism consists of disruption of the iris pigment epithelium secondary to iridolenticular friction, leading to dispersion of pigment particles throughout the anterior chamber and resulting in the classic clinical findings of corneal pigmentation (Krukenberg spindles); mid- through peripheral, radial, stiff-like iris transillumination defects, and dense pigment deposition of the trabecular meshwork. Abnormally increased indolenticular contact, due perhaps either to a less rigid than normal iris or and iris which is too large relative to the anterior segment, produces a situation in which pressure in the anterior chamber is greater than that in the posterior chamber (reverse pupillary block), causing posterior bowing of the mid-peripheral iris, which appears on ultrasound biomicroscopy as a topographical concavity. This concavity increases during accommodation and lessens with the onset of presbyopia, while inhibition of blinking reverses the iris contour from concave to convex. Accommodation is a cause of myopia, which correlates strongly with intelligence, a characteristic of patients with PDS. The proposed role of accommodation in the development of the phenotypic manifestations of the disorder suggests alternative routes of therapy beyond lowering of intraocular pressure.

**C028 GLAUCOMA AND UVEITIS**

K. Barton (chair) 1

1London, United Kingdom, 2Parma, Italy

Recalcitrant glaucoma is a common and potential blinding complication of chronic iridocorneal inflammation that responds poorly to medical therapy and is exacerbated by corticosteroid therapy. The aim of this course is to review recent advances in the pathogenesis, medical and surgical management of uveitic glaucoma. In particular the instructors will discuss: 1. The relative indications for new glaucoma medications and their potential interactions in patients with PDS and uveitis; 2. The role of alternative anti-inflammatory medications in patients with corticosteroid-sensitive glaucoma. 3. The relationship between accommodation and the development of the phenotypic manifestations of the disorder suggests alternative routes of therapy beyond lowering of intraocular pressure.

**C029 GLAUCOMA IN SYSTEMIC DISEASES**

D. Ghergel 2, K. Kashiwagi 3, M. Pache 4

2Basel, Switzerland, 3Birmingham, United Kingdom, 4Dresden, Germany

In the first part, Mona Pache will present a review on systemic findings in patients with primary open angle glaucoma. Doina Ghergel will then discuss the relationship between peripheral circulation and uveal circulation; the different provocation tests and the role of the autonomic nervous system. Josef Flammer will then discuss the behaviour of circulating lymphocytes in glaucoma patients.

**C030 NEW TONOMETRY / CCT / CONTINUOUS IOP MEASUREMENT – PART 2**

A. Wills (chair) 1, F. H. Grus 1, B. C. Little 4

1Wellingtton, New Zealand, 2Mainz, Germany, 3London, United Kingdom

Eye pressure lowering drugs is the foundation of glaucoma treatment today. Still, medical treatment has not been unchallenged. We can leave the question if it has an effect on the rate of optic nerve damage or not behind us, but there are several questions and decisions facing us in our daily practice. This course will focus on a number of topics that are important for better understanding of rational medical treatment.

Introduction: Dr. Albert Alm.

Medical treatment as first choice – pro and Con: Dr. John Thysengan.

How to initiate and evaluate glaucoma treatment: Dr. Robert D. Fechtner.

Why are drugs not always effective?: Dr. Paul L. Kaufman.


**C031 GUIDELINES ON DIAGNOSIS AND TREATMENT OF ACG – PART 2**

S. Friedman 1, A. Aung 1, P.J. Foster 2, D.B.C. Lam 3, P. Rojapanpong 3, R. Thomas 3, N.L. Wang 1, J. Zhai 1

1Baltimore, MD, USA, 2Singapore, 3London, United Kingdom, 4Hong Kong, China, 5Bangkok Thailand, 6Hyderabad, India, 7Beijing, China

**C032 PRINCIPLES OF MEDICAL THERAPY IN GLAUCOMA PRACTICE – PART 2**

G. Hotz 1, C.B. Camras 2, C.A. Ginkin 3, C. Migliazzi 4, J. Thyiagen 5

1Bangkok, Thailand, 2Boston, MA, USA, 3Brigham and Women’s Hospital, 4Birmingham, AL, USA, 5London, United Kingdom

In the first part, Mona Pache will present a review on systemic findings in patients with primary open angle glaucoma. Doina Ghergel will then discuss the relationship between peripheral circulation and uveal circulation; the different provocation tests and the role of the autonomic nervous system. Josef Flammer will then discuss the behaviour of circulating lymphocytes in glaucoma patients.

**C033 GLAUCOMA AND UVEITIS**

J. Flammer (chair) 1, D. Ghergel 2, K. Kashwagi 3, M. Pache 4

1Basel, Switzerland, 2Birmingham, United Kingdom, 3Yamanashi, Japan, 4Freiburg, Germany

**C034 PRACTICAL DIGITAL SLIT LAMP PHOTOGRAPHY – PART 2**

A.P. Wills (chair) 5, F. H. Grus 1, B. C. Little 4

1Wellington, New Zealand, 2Mainz, Germany, 3London, United Kingdom

**C035 MEDICAL THERAPY PRINCIPLES**

A. Alm (chair) 1, A. Azeira-Blanco 5, R. D. Fechtner 1, P. Kaufman 1, J. Thysengan

1Uppsal, Sweden, 2Aberdeen, United Kingdom, 3Newark, NJ, USA, 4Madison, WI, USA, 5Copenhagen, Denmark

**C036 NEUROPROTECTION AND APOPTOSIS OF RETINAL GANGLION CELLS RELATED TO GLAUCOMA**

L. Levin (chair) 1, M. F. Cortesio 1, N. N. Osborne 2, G. Tezel 3

1Madison, USA, 2London, United Kingdom, 3Oxford, United Kingdom

**C037 PRINCIPLES OF MEDICAL THERAPY IN GLAUCOMA PRACTICE – PART 2**

G. Hotz 1, C.B. Camras 2, C.A. Ginkin 3, C. Migliazzi 4, J. Thyiagen 5

1Bangkok, Thailand, 2Boston, MA, USA, 3Brigham and Women’s Hospital, 4Birmingham, AL, USA, 5London, United Kingdom

In the first part, Mona Pache will present a review on systemic findings in patients with primary open angle glaucoma. Doina Ghergel will then discuss the relationship between peripheral circulation and uveal circulation; the different provocation tests and the role of the autonomic nervous system. Josef Flammer will then discuss the behaviour of circulating lymphocytes in glaucoma patients.
C O U R S E S

Saturday, July 9, 2005

2.00 – 3.00 pm.

C037 OPTIMIZING TRABECULECTOMY OUTCOME: INTRAOPERATIVE TECHNIQUES – PART 1
F. Grein (chair), 1, K. Barton, 1, P.T. Khaw, 2, J. Liebmann, 3, P. Shah 4
1 Würzburg, Germany, 2 London, United Kingdom, 3 New York, NY, USA, 4 Birmingham, United Kingdom

Objective: Improvement of surgical technique to avoid immediate postoperative complications and long-term scar formation.

Methods: Presentation of the conjunctiva (torn or based versus limbus based), dissection of the scleral flap, and suture techniques are crucial to avoid postoperative hypopyon, overfiltration, choroidal detachment and flat anterior chamber. Checking the outflow of the scleral flap by anterior chamber irrigation gives an estimate for postoperative IOP. Suture techniques can be adapted for to release or to adjust sutures later. Watertight closure of the conjunctiva is equally essential. Mitomycin C or various concentrations (0.1-0.5%) should be used in a large sponge or in sponge pieces distributed over a large area of the subconjunctival space.

Conclusions: 1. Limbus-based conjunctival flap with a mattress suture at the limbus is the preferred conjunctival technique to avoid leakage; 2. Adjustable or releasable sutures, as well as anterior chamber irrigation to test outflow are the means to avoid postoperative complications from overfiltration; 3. Mitomycin C should be adapted to the anticipated postoperative wound healing reaction and should be used over a large subconjunctival area.

C038 FILTERING SURGERY: PENETRATING / NON-PENETRATING / IMPLANTS – PART 1
T. Shaarawy (chair), 1, T. Dietlein, 2, A. Mermod, 2, D.S. Minckler, 2, P. Palmberg, 2, C.E. Traverso, 2, R.P. Wilson 2
1 Genève, Switzerland, 2 Lausanne, Switzerland, 3 Cologne, Germany, 4 Los Angeles, CA, USA, 5 Miami, FL, USA, 6 Genova, Italy, 7 Philadelphia, PA, USA

In a glaucoma community that, rightfully, believe in evidence-based medicine, there is little room for any fine detail in glaucoma surgery to be scientifically validated. Never the less the minute modifications that result from decades of experience often make the difference between success and failure. This course, with its expert panel, shall address the fine surgical details in trabeculectomy, non-penetrating surgery, and tube implants, as practiced by the speakers who have refined their techniques through years of practice.

C039 MANAGING CATARACT AND GLAUCOMA – PART 1
J.C. Caprioli (chair), 1, I.K. Ahmed, 2, A.S. Granada, 2, D.S. Lam, 2, R.F. Tomey, 2, C.E. Traverso, 2
1 Los Angeles, USA, 2 Toronto, Canada, 3 Salt Lake City, UT, USA, 4 Hong Kong, China, 5 Beirut, Lebanon, 6 Genova, Italy

Objective: To review and discuss the approaches to treating patients with cataract and coexisting glaucoma.

Main message: Patients with cataract and glaucoma may be treated with 1) cataract surgery first or alone, 2) filtering surgery first followed by cataract surgery later, or 3) with combined cataract and glaucoma surgery. Combined surgery should be performed through separate surgical sites or through the same site. The choice of the surgical approach depends on the severity and rate of progression of glaucoma, the patient’s age, and other risk factors.

Conclusion: Patients with cataract and mild glaucoma may require only cataract surgery. Patients with advanced or advancing glaucoma are best served by filtering surgery performed alone. Patients with loose lenses, short eyes, and those with chronic angle closure glaucoma, ALT could be offered for patients with heavily pigmented and for those patients who are infirm, elderly, or have a short life expectancy.

C040 LASER SURGERY OF THE IRIS AND THE ANGLE: LPI-ALT IRIDOPLASTY
Y. Lachkar (chair), 1, J. Katz, 2, R. Amin, 2, J. Thysager, 2
1 Paris, France, 2 Philadelphia, USA, 3 Morgantown, USA, 4 Copenhagen, Denmark

Indications: Procedure, lenses used, technique with laser parameters, complications and their treatments will be discussed.

LASER IRIDOTOMY
Indication: Clinically relevant pupillary block.
Preoperative preparation: Pigmentpene 2% or 4% single instillation and -Prevention of IOP spikes.
Procedure: A laser iridotomy contact lens is needed.
Iridotomy site: 1. superior quadrants of the iris covered by the upper lid (to prevent monococular diplopia). 2. avoid the 3 o’clock and 9 o’clock positions to lessen discomfort and reduce the risk of hitting the iris vessels. 3. avoid visible vessels, 4. as far peripherally as possible within the arcus senilis. 5. choose a thin looking area or an iris crypt, 6. electively superonasal to reduce the likelihood of a macular injury when using the Argon laser.

Laser parameters will be discussed. The purpose of the procedure is to obtain a full thickness hole of sufficient diameter to resolve the pupillary block. Perforation is assumed when pigment, mixed with aqueous, flows into the anterior chamber. The iris usually falls back and the peripheral anterior chamber deepens. Patency must be confirmed by direct visualization of the lens through the iridotomy. Transillumination through the pupil or the iridotomy is not a reliable indicator of success. The optimal size of the iridotomy is 100 to 500 µm.

Complications and Post-operative management will be discussed.

LASER TRABECULOLAPSY
Indications: POAG, exfoliative and pigmentary glaucoma when IOP is not satisfactorily controlled with medications; where the latter are contraindicated, or where compliance is a problem; such as in the elderly. Should initial medical therapy fail to control the patient’s glaucoma, ALT could be offered for patients with heavily pigmented and for those patients who are infirm, elderly, or have a short life expectancy.

Preoperative preparation: prevention of IOP and topical anaesthesia.
Procedure: Argon laser (Green or Blue/Green) Diode laser Selective laser will be discussed. Complications and Post-operative management will be discussed.

LASER IRIDOPLASTY
Indication: 1. To widen the angle approach by shrinking the peripheral iris using a thermal effect; 2. Plateau iris syndrome. 3. In preparation for ALT when the angle approach is narrow, in order to better visualize the TM. 4. Angle closure in nanophthalmos.
Preoperative preparation: Contraindications will be discussed. Laser parameters will be discussed. Goal of treatment is contraction of the peripheral iris with flattening of the peripheral iris curvature. Ideal number of impacts: 20-50 applications over 360° leaving 2 beam diameters between each spot and avoiding visible radial vessels. Complications and follow up will be presented.

3.15 – 4.15 pm.

C042 THE USE OF RELEASABLE SUTURES IN GLAUCOMA SURGERY
R.P. Wilson (chair), 1, J.S. Cohen 2
1 Philadelphia, PA, USA, 2 Cleveland, OH, USA

E. Modifications offered by Shih, and Hus and Yarng.

Comparison: A. Cohen/Osher technique: 1. Easiest to do; 2. Causes no astigmatism; 3. Fibrosis through suture loop under conjunctiva limits length of time it can be left in place and then removed; 10-14 days in my experience. B. Wilson technique: 1. Relatively easy to place; 2. Causes astigmatism when in place; completely resolves when removed; 3. Epithelium grows over suture making exteriorized suture surprisingly comfortable if knot trimmed of rabbit ears; 4. Can be left in place for years and easily removed; C. Johnstone technique: 1. Most complex with longest learning curve; 2. Described only with limbal-based conjunctival flap; 3. Time and complexity prevent covering the Johnstone technique in this short talk; refer to reference for good illustrations on the technique; D. All techniques effective in markedly reducing complications of post-operative hypotony without compromising long-term IOP results; 1. Can be used with both limbus and fornix-based conjunctival flaps; 2. Should not be released or removed at target pressures or below unless enough time has passed for fibrosis to limit increased outflow; antifibrosis regimen needs to be included in this calculation.

Cohen/Osher technique: 1. Needle paths: A. Needle paths: B. Suture diagram prior to tying:

C. Suture diagram after tying:

D. To release, grab suture where exteriorized on surface and pull; E. If low IOP mandates leaving suture in place or if fibrosis through loop prevents its removal, pull suture out of distal corneal track, pull gently on suture and cut flush where suture emerges from sub-limbal track – will heal and be comfortable.

Wilson technique: A. Needle Paths: B. Suture diagram:

C. Tips: 1. Diverge suture tracks under limbus – when suture cut for removal, it is under tension and will retract; large knot (extra throws) and longer track on corneal surface leave enough room and to grab for removal even after retraction; 2. To tie, put 4 throws in suture, pull ends toward feet then apart to set knot; adjust tension and add extra throws; 3. When removing: a. Cut suture on corneal surface at comer as far away from trabeculectomy as possible; b. Grab remaining suture and pull slowly but steadily downward toward floor (easy does it – like having a six pound salmon on a two pound test line).

C043 FIBROSIS INHIBITION WITH FILTRATION SURGERY
P. Khaw (chair), 1, C. Baudouin, 2, J. Crowston, 2, B.E. Prun, 2
1 Paris, France, 2 La Jolla, CA, USA, 3 Charlotteville, VI, USA

This course will enlarge upon the presentations and discussion during the morning session (Consensus). Risk factors for scarring should be known. The various methods for modula-
C046 CYCLOPHOTOCOAULATION – WHY, WHEN & HOW?  
P.Bloom (chair) 1, D. Borse 2, S. Suacecas 3, 4  
1Los Angeles, CA, USA, 2Miami, FL, USA, 3Milwaukee, WI, USA, 4São Paulo, Brazil  

Summary: This instruction course will teach contemporary methods of cyclophotocoagulation. The aim of the course is to provide attendees with the theoretical information and practical skills necessary to begin to perform these techniques.  

Why? The rationale for cyclophotocoagulation will be discussed in the context of other modern medical, laser and surgical treatments for glaucoma. Older methods of cycloablation (cryotherapy and YAG laser) will be mentioned.  

When? The place of cyclophotocoagulation, both trans-scleral and endoscopic, will be discussed with reference to a modern treatment paradigm. Specifically the relevant timing of these treatments will be discussed in relation to other surgical treatments including trabeculectomy and glaucoma drainage device surgery.  

How? The surgical techniques will be illustrated by means of graphics, photographic illustrations and videos.

C047 OPTIMIZING TRABECULECTOMY OUTCOME: POSTOPERATIVE MANAGEMENT – PART 2  
F. Brecher (chair), K. Barton 1, P.T. Khaw 2, J. Liebmann 3, P. Shah 4  
1Miami, FL, USA, 2Los Angeles, CA, USA, 3Miami, FL, USA, 4São Paulo, Brazil  

Objective: Postoperative management is an essential part of glaucoma surgery. This session will cover the latest advances in postoperative management for trabeculectomy.

Main message: Active bleb management is essential for optimal management of glaucoma surgery.

Main message: 2. Steroids and 5-FU are the means to overcome excessive wound healing in the postoperative period. 3. Complications such as overwhelming infection can be prevented and managed by careful postoperative care.

C048 FILTERING SURGERY: PENETRATING / NON-PENETRATING / IMPLANTS – PART 2  
T. Shaffer (chair), T. D’Alessandro, D. V. Heuer 4  
1Los Angeles, CA, USA, 2Toronto, Canada, 3Salt Lake City, UT, USA, 4Hong Kong, China, 5Beirut, Lebanon  

Objective: To deliver information to the attendees that can be readily incorporated into clinical practice. Presentations will be validated with an evidence-based orientation. Pearls gleaned from clinical experience will be shared.

Main message: The contents will be divided into three topics: 1. Potential hazards in off-sized eyes. An overview. This presentation will deal with the description of the potential problems, the recognition of the signs and the asking of the right questions concerning these complications. High myopia: overfiltration, hypotony maculopathy, suprachoroidal hemorrhage, others. 2. Phacoemulsification: phacoemulsification and other complications; 3. Coping with the oversized. Answers on how to prevent and to manage complications in highly myopic eyes. Overfiltration, hypotony maculopathy, suprachoroidal hemorrhage (How to operate to beat them, how to adjust filtration, role of subretinal/relasable sutures in trabeculectomy, when and how to use antimetabolites, implant surgery in highly myopia, non-penetrating, others, how to manage overfiltration and hypotony maculopathy). Glaucoma surgery in myopic eyes with previous vitreoretinal operations; 4. Coping with the undersized. Answers on how to prevent and to manage complications in high hyperopic eyes. Preoperative and postoperative ciliolateral effusion, malignant glaucoma, prophylactic posterior and anterior segment measures, how to filter minimizing risks, other surgical options for glaucoma in phakomatoses and their role, lens extraction, implants, cyclodestruction). A final discussion with participation of the audience will take place after the presentations.

C050 SIZE MATTERS: INTRAOCULAR SURGERY IN HIGHLY MIOPIC OR NANOPHTHALMIC EYES  
D.E. Diringer 1, R Grossi 2, H. Tanahara 3  
1Buenos Aires, Argentina, 2Houston, TX, USA, 3Tokyo, Japan  

Objective: To deliver information to the attendees that can be readily incorporated into clinical practice. Presentations will be validated with an evidence-based orientation. Pearls gleaned from clinical experience will be shared.

Main message: The contents will be divided into three topics: 1. Potential hazards in off-sized eyes. An overview. This presentation will deal with the description of the potential problems, the recognition of the signs and the asking of the right questions concerning these complications. High myopia: overfiltration, hypotony maculopathy, suprachoroidal hemorrhage, others. 2. Phacoemulsification: phacoemulsification and other complications; 3. Coping with the oversized. Answers on how to prevent and to manage complications in highly myopic eyes. Overfiltration, hypotony maculopathy, suprachoroidal hemorrhage (How to operate to beat them, how to adjust filtration, role of subretinal/relasable sutures in trabeculectomy, when and how to use antimetabolites, implant surgery in highly myopia, non-penetrating, others, how to manage overfiltration and hypotony maculopathy). Glaucoma surgery in myopic eyes with previous vitreoretinal operations; 4. Coping with the undersized. Answers on how to prevent and to manage complications in high hyperopic eyes. Preoperative and postoperative ciliolateral effusion, malignant glaucoma, prophylactic posterior and anterior segment measures, how to filter minimizing risks, other surgical options for glaucoma in phakomatoses and their role, lens extraction, implants, cyclodestruction). A final discussion with participation of the audience will take place after the presentations.

C051 PHACOEMULSIFICATION IN COMPLICATED GLAUCOMA CASES  
J. Gao 1, Xiangzhong, P.R. China  

Objective: To review and demonstrate the surgical techniques using phaco in the management of complicated glaucoma, such as uveitic and malignant glaucoma.

Main message: Phaco surgery is one of options in the management of complicated glaucoma, phacotrabeculectomy in malignant and uveitic glaucoma, however, challenges and difficulties coexist. By using videos, photos and special case discussion, we will outline the technique and management of intra-operative complications, also point out the advantages of phaco surgery in this management.

Main message: Phacoemulsification is effective and less invasive surgical management in complicated glaucoma.

C052 NON-PENETRATING TRABECULECTOMY – THE ROLE OF INTRACULAR YAG LASE  
D. Grigera 1, R Grossi 2, H. Tanihara 3  
1Buenos Aires, Argentina, 2Houston, TX, USA, 3Kyoto, Japan  

Objective: To discuss the techniques and the management of complications in congenital glaucoma. By presenting one typical case, we will discuss the indications, techniques and complications of this surgical management.


C053 PHACOEMULSIFICATION IN COMPLICATED GLAUCOMA CASES  
A. Ahmed 1, A.S. Crandall 2, D. S-C. Lam 4, K.F. Tomey 5, C.E. Traverso 6  
1Los Angeles, CA, USA, 2Miami, FL, USA, 3São Paulo, Brazil, 4Milwaukee, WI, USA, 5Beirut, Lebanon, 6Genova, Italy  

Objective: To discuss the indications, techniques and complications of this treatment procedure, particularly point out the factors determining the success rates.

Main message: Evidence-based and/or experience-based answers will be delivered for the following questions: 1. Which are the indications for cataract/trabeculectomy/combined surgery in non-atropic eyes with POAG? 2. How to evaluate the risk of hypotony maculopathy? suprachoroidal hemorrhage in highly myopic eyes? 3. How to prevent and to manage overfiltration/hypotony maculopathy in highly myopic eyes? 4. How to perform a trabeculectomy/lens extraction/combined surgery in a non-atropic eye? 5. How to best manage a ciliolateral effusion? 6. How to best manage hypotony maculopathy? 7. Which is the role for other techniques in off-sized eyes (implants, non-penetrating etc)?

C054 POSTOPERATIVE MANAGEMENT OF COMPLICATED GLAUCOMA  
J. Zhao 1  
1Shanghai, P.R. China  

Objective: To review and demonstrate the surgical techniques using phaco in the management of complicated glaucoma, such as uveitic and malignant glaucoma.

Main message: Phaco surgery is one of options in the management of complicated glaucoma, phacotrabeculectomy in malignant and uveitic glaucoma, however, challenges and difficulties coexist. By using videos, photos and special case discussion, we will outline the technique and management of intra-operative complications, also point out the advantages of phaco surgery in this management.

Main message: Phacoemulsification is effective and less invasive surgical management in complicated glaucoma.

C055 SURGICAL MANAGEMENT OF COMPLICATED NEOVASCULAR GLAUCOMA  
M. He 1  
1Shanghai, P.R. China  

Objective: To discuss the indications, techniques and complications of this treatment procedure, particularly point out the factors determining the success rates.

Main message: Evidence-based and/or experience-based answers will be delivered for the following questions: 1. Which are the indications for cataract/trabeculectomy/combined surgery in non-atropic eyes with POAG? 2. How to evaluate the risk of hypotony maculopathy? suprachoroidal hemorrhage in highly myopic eyes? 3. How to prevent and to manage overfiltration/hypotony maculopathy in highly myopic eyes? 4. How to perform a trabeculectomy/lens extraction/combined surgery in a non-atropic eye? 5. How to best manage a ciliolateral effusion? 6. How to best manage hypotony maculopathy? 7. Which is the role for other techniques in off-sized eyes (implants, non-penetrating etc)?

C056 SURGICAL MANAGEMENT OF COMPLICATED NEOVASCULAR GLAUCOMA  
M. He 1  
1Shanghai, P.R. China  

Objective: To discuss the indications, techniques and complications of this treatment procedure, particularly point out the factors determining the success rates.

Main message: Evidence-based and/or experience-based answers will be delivered for the following questions: 1. Which are the indications for cataract/trabeculectomy/combined surgery in non-atropic eyes with POAG? 2. How to evaluate the risk of hypotony maculopathy? suprachoroidal hemorrhage in highly myopic eyes? 3. How to prevent and to manage overfiltration/hypotony maculopathy in highly myopic eyes? 4. How to perform a trabeculectomy/lens extraction/combined surgery in a non-atropic eye? 5. How to best manage a ciliolateral effusion? 6. How to best manage hypotony maculopathy? 7. Which is the role for other techniques in off-sized eyes (implants, non-penetrating etc)?
Conclusions: Outcomes of surgical treatment in congenital glaucoma are various and depends on the careful patients' selection, techniques and postoperative follow-ups.

Drainage implants in refractory glaucoma
X. Sun

Objectives: To review and discuss the indication, techniques, complications and outcomes on performing drainage implants in refractory glaucoma.

Main messages: Management of refractory glaucoma is difficult when routine treatments are no longer effective in controlling the intraocular pressure. In this course, we will review the current commonly used drainage implants in clinical practice, share our experience in the indication, surgical techniques, postoperative management. We will also review the factors associated with outcomes and emphasize how to improve the success rate. Conclusions: Drainage implant is effective in controlling intraocular pressure when the complications are able to managed properly.
1. GENERAL ASPECTS

P001 PREVALENCE OF GLAUCOMA IN URBAN ADULT CHINESE: A POPULATION BASED SURVEY IN LIANWU DISTRICT, GUANGZHOU

M. Hu, P.J. Foster, W. Huang, P.T. Khaw
Zhongshan Ophthalmic Center, Guangzhou, China, University College London, United Kingdom.

Introduction: Data on prevalence of glaucoma in mainland China are scarce.

Aim of the study: To assess the prevalence and clinical characteristics of glaucoma in adult Chinese.

Methods: A total of 2313 subjects aged 50 years and over were identified from Household Registration Registry and door-to-door enumeration using clustered random sampling procedure. Glaucoma was diagnosed on ophtalmoscopy with 97.5% of vertical cup disc ratio (VCDR) or asymmetry with a reproducible visual field defect, or on the basis of 99.5th percentile VCDR or visual field alone if field defect was not available. If both, both optic and visual field assessment were not possible, the diagnosis was based on blind vision with 99.5th percentile intraocular pressure or previous glaucoma filtering surgery and reliable medical records. The classification of the angle was based on gonioscopy.

Results: In a total of 1504 subjects (75.3%) examined, crude prevalence of all glaucoma was 3.8% (95% confidence interval [CI] 2.8%-4.8%). Primary open-angle glaucoma (POAG) was found in 2.1% (95%CI: 1.4%, 2.8%), primary angle-closure glaucoma (PACG) in 1.5% (95%CI: 0.8%, 2.1%). The prevalence of all glaucoma was significantly higher in older and male cohort.

Conclusions: Prevalence of POAG was found to be more than the previous data in mainland China but was similar to that of Chinese Singaporean.

References:

P002 CENTRAL CORNEAL THICKNESS IN AN OLDER POPULATION: THE BLUE MOUNTAINS EYES STUDY

Centre for Vision Research, University of Sydney, Sydney, Australia.

Purpose: The accuracy of Goldmann applanation tonometry can vary if central corneal thickness (CCT) varies from the 500 microns assumed in the original formula1. A number of studies have reported increased CCT in elderly population2-5. However reports from the relatively few population-based studies have been conflicting1,6,7. The aim of this study was to describe the distribution and associations of CCT in CCT in a defined population of people aged 50 years and above from rural Tamil Nadu (India) were included. The International Society of Geographical and Epidemiologic Ophthalmology (ISGEO) definitions were used for the study.

Design: Cross sectional study.

Participants: 3880 eyes ( 3880 participants) 1501 males and 1777 females. The distribution showed a skew to the right.

Main outcome measure: Intraocular pressure.

Results: There were 1501 males and 1777 females. The skewed distribution showed a skew to the right. The mean central corneal thickness (CCT) was 538.68 microns (SD: ±10.65) years. PACS was seen in 302 eyes (7.7%), (including primary angle closure glaucoma and pseudoexfoliation syndrome (PES)). The prevalence of PACS was significantly higher than the previous data in this population.

Conclusions: The proportion of diagnosed cases receiving any form of therapy. A next logical step may emphasise public awareness and initiatives to improve the proportion in those receiving therapy.

References:

P003 GONIOSCOPIC CHARACTERISTICS OF AN ADULT POPULATION FROM A POPULATION BASED STUDY IN THE UNITED STATES OF AMERICA

Centre for Vision Research, University of Sydney, Sydney, Australia.

Introduction: Glaucoma is one of the most important causes of preventable blindness worldwide. There are several glaucoma registries in the United States of America, 3Moorfields Eye Hospital, London, United Kingdom, 3Moorfields Eye Hospital, London, United Kingdom.

Aim of the study: To describe the distribution and associations of CCT in an older population from rural Tamil Nadu (India) were included. The International Society of Geographical and Epidemiologic Ophthalmology (ISGEO) definitions were used for the study.

Design: Cross sectional study.

Participants: 3880 eyes ( 3880 participants)

Main outcome measure: Intraocular pressure.

Results: Intraocular pressure. There were 1501 males and 1777 females. The distribution showed a skew to the right. The mean central corneal thickness (CCT) was 538.68 microns (SD: ±10.65) years. PACS was seen in 302 eyes (7.7%), (including primary angle closure glaucoma and pseudoexfoliation syndrome (PES)). The prevalence of PACS was significantly higher than the previous data in this population.

Conclusions: The proportion of diagnosed cases receiving any form of therapy. A next logical step may emphasise public awareness and initiatives to improve the proportion in those receiving therapy.

References:
P006 SYMPTOMATIC INCIDENT CASES OF OPTIC DISC HAEMORRHAGE IN A LONGITUDINAL STUDY

Introduction: Optic disc haemorrhage (DH) is a well-known risk factor for glaucoma.1-9. We have previously reported that the population prevalence of DH is higher than previously thought.10.

Aims: To determine the frequency and associations of new episodes of DH detected in the same population at 5- and 10-year follow-up examinations.

Methods: Stereoscopic optic disc photographs were taken of 3654 baseline participants aged 49 years in the Blue Mountains Eye Study. At the 5- and 10-year examinations, 2334 and 1953 participants were examined (75% and 75% of survivors at each interval). 2263 and 1624 persons had gradable photographs at the 5-year and 10-year examinations. DH were identified from stereoscopic optic disc photographs (35 mm film) by trained graders and confirmed by an ophthalmologist. Participants were presumed to have died if a DH was detected at the 5- or 10-year examinations in eyes without DH at baseline.

Results: Among the 51 persons who had a DH at baseline, 5 of 22 (22.7%) who were re-examined at 5 years and 5 of 15 (33.3%) who were re-examined at 10 years had further haemorrhages. After excluding the 5 persons who were found to have a DH at baseline, DH identified at subsequent examinations were considered present if there was at least one incidence of DH at either or both eyes in the 5- or 10-year examinations. The overall incidence of DH in either or both eyes was 1.16% (268 persons, 28 eyes) at the 5-year examination and 1.91% (323 persons, 35 eyes) at the 10-year examination. Ninety percent (145 persons, 155 eyes) had a DH at baseline. The incidence of DH at baseline was 1.1-2.0 and vertical cup-disc (CD) ratio greater than 0.5 at baseline (OR: 2.6, CI: 1.5, 4.5), after adjusting for age and vertical optic disc diameter. DH were more frequent in left than right eyes (OR: 1.3, CI: 1.0, 1.7). Potential risk factors including baseline hypertension, diabetes, BRVO and IOP were also assessed and no significant associations were found. Gender, regular use of aspirin and history of self-reported migraine were also not related to incident DH. Re-localisation of DH was assessed. Conclusions: Our data indicate a higher 5-year incidence of new disc haemorrhage episodes (1.2%) than reported from the Beaver Dam eye study (0.4%). Due to the transient nature of optic disc haemorrhage (PM), incident and recurrent episodes that form this population-based cohort study are likely to considerably underestimate the true incidence.

References:

P007 THE PREVALENCE OF OPTIC DISC PITS

P.R. Healey, P. Mitchell Centre for Vision Research, Westmead, Australia

Introduction: A pit of the optic disc was first reported in 1882 and an acquired pit in 1951.1 Radius described incident pits of the optic nerve in open-angle glaucoma, both clinically and histologically demonstrating an association with glaucoma, progression and low tension glaucoma.2 Subsequently a number of authors confirmed these findings in clinic-based studies.3 5. There are no epidemiological data on optic disc pits, precluding accurate estimates of prevalence or unbiased associations.

Aims: To describe the prevalence and associations of optic disc pits in a well-defined older population.

Methods: Subjects were from the Blue Mountains Eye Study, a population-based survey of 3654 individuals over 49 years, living near Sydney during 1992-4. The presence of an optic disc pit was graded in a masked fashion from stereo-photographs. Open angle glaucoma (OAG) was diagnosed when typical glaucomatous visual field loss on the Humphrey 30-2 test matched optic disc rim loss.

Results: Disc photographs were gradable in 98% of participants. Optic disc pits were found in 12 eyes of 10 patients, a prevalence of 0.17%. Pit prevalence increased with age (B=0.063, p=0.0291) from 0.0% for ages 49-59, 0.15% for ages 60 to 69, 0.21% for ages 70 to 79 years and 0.43% for 80+ years. Five pits were found in subjects with OAG (OR 19.951; 5.69 age-adjusted) but only 2 were found at the time of presentation. Six pits were present with beta-ceptor antagonists (OR 4.91 1.3-13.3 age-adjusted) and 3 in eyes with a disc haemorrhage (OR 31.951; 1.25 age-adjusted).

Conclusions: There is a higher estimate of the prevalence of optic disc pits. They suggest that in an older population, optic disc pits are principally associated with glaucoma and the papillitis signs of disc haemorrhage and beta-ceptor antagonists. Pit prevalence was similar to age-matched clinic-based studies in the detection of pits in normal tension glaucoma found in 2 previous studies4 5 may be due to a referral bias favouring patients with more obvious abnormalities of the disc.

References:

P008 GONIOSCOPIC DISTRIBUTION IN LATIN-AMERICAN ADULTS. ANALYSIS OF GONIOSCOPY IN 4913 EYES OF LATINOS 40 YEARS OR OLDER

Z. Montenegro Fundación Santalé de Bogota, Bogota, Colombia

Clinical Objective: To describe the gonioscopic appearance of eyes in a Latin American popul- nation and correlates it with the occurrence of glaucomas new cases.

Design: Observational longitudinal case control study

Participants: 2492 latin-american patients of 40 years or older seeking primary ophthalmology consulta- tion at the Fundación Santalé (FSFB) clinic

Methods: Comprehensive adult initial eye examination and gonioscopic description were kept in the electronic database for future analysis.

Primary outcome: Classification of the angle appearance

Secondary outcome: Initial glaucoma diagnosis

Results: 4913 eyes of 2944 patients were analyzed. 93% eyes had open angle and 1.6% showed closed angle. We established an initial diagnosis of glaucoma and/or angle alteration in 287 patients. 5% of the patients were glaucoma suspects. In 3% of the individuals chronic primary open angle glaucoma was confirmed. In 1.3% of the patients we established a diagnosis of closed angle glaucoma, and in an additional 1.9% of the patients the angle was narrow.

Conclusion: There is a predominance of open angle in this population. The prevalence of normal angles is larger than the number of established primary open angle glauces cases.

References:
quality of life and topical glaucoma treatment side effects. Health Qual Life Outcomes. 2003; 11(22) 10: 312.


P011 ASSESSING QUALITY OF LIFE IN GLAUCOMA PATIENTS USING THE GLAUCOMA QUALITY OF LIFE -15 (GLQ-15) QUESTIONNAIRE

I. DaSilva Jr, V itemprop="fnPerson" itemprop="familyName">Augusto</itemprop="fnName" itemprop="givenName">Jr</itemprop="fnName">, M. Tavares, L. Azevedo, T. Carvalho, D. S. Araújo, C. R. Healy</itemprop="fnName" itemprop="givenName">Eye</itemprop="fnName" itemprop="familyName">Associates</itemprop="fnName" itemprop="givenName">Sydney</itemprop="fnName" itemprop="givenName">, Australia, 2 Allergan Inc, Irvine, CA, United States of America

Objective: We assessed QOL using the GLQ-15 in a cohort of patients with OAG and correlated self-reported visual disability with objective measures of visual function.

Design: Despite the presence of visual acuity loss without symptoms, patients with open-angle glaucoma (OAG) may experience difficulty with daily activities from its early stage onwards. A new questionnaire, the GLQ-15, has been specifically developed to assess quality of life (QOL) in glaucoma patients with visual impairment. We assessed visual disability for four activity groups: (i) central acuity, (ii) peripheral vision, (iii) dark adaptation and glare, (iv) personal care and (v) outdoor mobility.

Participants: Patients with and without OAG attending an urban glaucoma practice and meeting the study’s exclusion criteria were enrolled from May to October 2004.

Methods: All QOL questionnaires were delivered by a Fundus PhotoScan Analysier (HPA) prior to completing the GLQ-15. Information on glaucoma type, current treatment, visual acuity, HFA mean deviation (MD), HFA pattern standard deviation (PSD) and number of binocular points missed (≥25 degrees) were collected. Correlation coefficients were calculated using the Spearman’s correlation test.

Results: Fifty patients with OAG and 31 controls were enrolled. On a scale from 15 (no visual disability) to 75 (severe disability for all visual tasks), the mean GLQ-15 summary score was 18.5 for controls and 30.5 for OAG. The GLQ-15 summary score was significantly correlated with visual acuity (r = 0.4971, p<0.001), MD, severity (r = 0.4978, p<0.001), and number of binocular points missed (r = 0.5882, p<0.001). GLQ-15 summary scores were significantly higher in patients with OAG (p < 0.0019), moderate (p<0.001) or advanced (p<0.001) compared to controls.

Conclusion: By using the GLQ-15 questionnaire, we have demonstrated that patients with OAG report a decline in QOL when compared to age-matched controls. Our results suggest that the GLQ-15 correlates strongly with reduced VA, severity of visual field defects and presence of binocular field defects. Further analysis will reveal whether specific visual functions, such as glare and dark adaptation, are affected more adversely in early, moderate or advanced OAG.

P012 THE VALIDITY OF SCREENING FOR GLAUCOMATOUS OPTIC NERVE DAMAGE USING CONFOCAL SCANNING LASER OPHTHALMOSCOPY (HRT III) IN HIGH- RISK POPU- LATIONS: A PILOT STUDY

P. Harayama, D. P. Mathrakheaka, A. Kandemur-Fani, M.R. Lask University de Montréal, Montréal, Québec, Canada

Purpose: To evaluate whether confocal scanning laser ophthalmoscopy (HRT III) is a valid tool for the detection of glaucomatous optic nerve damage.

Design: This was an observational, cross-sectional, non-consecutive study that took place in Montréal, Québec, Canada.

Participants: 303 non-contiguous, ‘high-risk’ subjects were enrolled during a six-month period.

Methods: Subjects underwent confocal scanning laser ophthalmoscopy (HRT III) testing, and a standard ophthalmologic examination, including gonioscopy, intracocular pressure measurement, and optic disc grading using cup-to-disc ratio and DOLS grading.

Outcome measures: These included positive and negative Likelihood Ratios (LR; LR-), sensitivity and specificities, positive and negative predictive values (PPV; NPV) as well as kappa coefficient (κ).

Aim of the study: To compare an oxidative stress marker in non-glaucomatous eyes to eyes with primary open angle glaucoma.

Main outcome measures: Oxidative stress may probably be one of the numerous factors inducing cell damage in glaucoma.


2. ANATOMICAL AND PATHOPHYSIOLOGICAL ASPECTS

P014 VISUALIZATION OF THE AQUEOUS OUTFLOW PATHWAY BY FINITE ELEMENT MODEL OF THE EYE. AN ATTEMPT TO MODELIZE THE DRAINAGE DEVICE FUNCTION

J. Broquet, S. Roy, A. Mermont Ophthalmic Eye Hospital Jules Gasson, Lausanne, Switzerland

Objective: To provide a synthetic model of the eye that analyses the hydrodynamic parameters of the aqueous humor outflow after drainage surgery.

Design: Experimental study based on the reproduction of the aqueous outflow by finite element model of the eye.

Controls: Simulations were conducted in five models of normal eyes, then on modified eyes simulating drainage device surgery.

Methods: Computer simulation of the identification and visualization of the main components of the outflow facility that play a key role in the dynamic of aqueous outflow. The effect of outflow facility changes after glaucoma surgery by the mean of drainage devices can be simulated and modification of the resistance to aqueous egress can be depicted. A computer model of the anterior segment of the eye has been designed. Ciliary body, anterior hyaloids membrane, Descemet’s membrane and cornea, trabecular angle, trabecular meshwork, Schlemm’s canal, collector channels, aqueous veins and conjunctiva were defined. After ijet- ing the conditions for the fluid flow in the eye, the volume and out for glaucoma were assigned the program was initiating the aqueous flow in respect with the velocity, force, pressure and temperature parameters in the 3D structure of a virtual eye. Drainage devices consisted in placing a tube implant on the anterior chamber with or without a stent.

Main outcome measures: Pressure gradient: 7.5 mHg. Velocity: 10 m/s. Aqueous flow: 2 µm/min. Trabecular resistance: 1.01*10^5 kg/m^2/s. Drainage device resistance: 3.91*10^5 kg/m^2/s.

Results: The pressure gradient and the velocity vectors showed that the most important drop in pressure in changes in velocity occurred in normal at the trabeculum/Schlemm’s canal interface. The lines of flow were converging to the iridocorneal angle, flowing through the trabeculum, and Schlemm’s canal into collector channels in normal and through drainage device in modified eye in drainage surgery.

Conclusions: Computer simulation using the finite element model to represent the hydrodynamic properties of the aqueous pathway enables good visualization of the lines of flow. Dynamic characteristics in respect with velocity and pressure gradient along the several drops of resistance can be clearly depicted. Most of the resistance to aqueous egress occurs at the trabecular meshwork and Schlemm’s canal system. In normal and through the drainage device after surgery infiltration. Reiterations in the drainage device geometry and function can be designed and visualized.


P015 MALONDIALDEHYDE AS A MARKER OF OXIDATIVE STRESS IN THE SERUM AND THE AQUEOUS HUMOR OF PATIENTS WITH GLAUCOMA EYES

C. Fauchinger, O. Schmid, C. Kirchgang, G. Moobseck Medical University of Graz, Graz, Austria

Introduction: Oxidative stress may probably be one of the numerous factors inducing cell dam- age in glaucoma.

Aim of the study: To compare an oxidative stress marker in non-glaucomatous eyes to eyes with pseudoxfoliation syndrome and primary open angle glaucoma.

Materials: In this cross-sectional study, the oxidative stress marker of non-glaucomatous (eyes 111), and eyes with pseudoxfoliation syndrome (29) and primary open angle glaucoma (36) were analyzed for malondialdehyde and xanthine oxidase activity.

Results: The mean of the TBARS in the serum of the control group (non-glaucomatous eyes) was 1.15 μM (range 2.34–0.10), in the oxidative stress markers (1.11 (2.25–0.31) and 0.35 (0.79–0.10), in the eyes with primary open angle glaucoma 1.14 (2.26–0.26) and 0.32 (0.94–0.04), respectively. There was no statistical significant difference to the results of the control group.

Conclusion: Lipid peroxides like malondialdehyde result as an oxidative product of lipid oxid- ation of the cellular membrane and are therefore markers of oxidative stress damage. We found no statistical significant difference between a control group and eyes with primary open angle glaucoma.

trophy of relay neurons in magno- and parvocellular layers of the lateral geniculate nucleus in five normal control monkeys were studied.

References


P019 RELEVANCE OF PI3 IN IN-HUMAN TENDEDY'MOBILIBRANS TRANS-DIFFERENTIATION

T Meyer-ter-Vehn 1, S Saparbeh 1, F Grishm 1, P Knau 1, S Schleuch 1

University of Eye Hospital Würzburg, Würzburg, Germany, University Eye Hospital, Würzburg, Germany, *Institute for Biochemistry, FU, Berlin, Germany

Purpose: Postoperative fibrosis bleeds due to scar formation is still the most important problem in fistulating glaucoma surgery. TF-β is a pivotal cytokine in this scarring process and specific inhibition of TF-β signaling may therefore offer new treatment options. As our previous experiments had indicated a role of p38 in TF-β signaling in human tenon fibroblasts, we investigated the functional significance of p38 in myofibroblast transdifferentiation.

Methods: Primary human tenon fibroblast (HTF) cultures were characterized by immunocytochemistry and treated with TF-β. The time course of MAPK signaling and the influence of various kinase inhibitors on alpha smooth muscle actin (AMA) expression were assessed by Western blot. On a functional level, the effects of TF-β and kinase inhibitors were studied in a myofibroblast transdifferentiation assay, and the cell contraction was analyzed by a phase contrast microscope.

Results: TF-β activates p38 in a sustained biphasic manner, while ERK is activated briefly. TF-β inhibitors SB203580, SB239068, and SB220025 diminished TF-β-induced myofibroblast transdifferentiation and reduced the cell contraction. The ERK-inhibitor U0216 had no effect. Both, spontaneous and TF-β-induced collagen gel contraction were attenuated by SB203580 and slightly increased by U0216, p38-inhibitor diminished stress-fiber formation in collagen gel embedded HTF.

Conclusions: TF-β-induced myofibroblast transdifferentiation is structurally and functionally associated with p38-inhibitors. Further, the intrinsic contraction of HTF-populated collagen gel is diminished by p38-inhibition. These data indicate a significant role of p38 in human tenon fibroblast transdifferentiation. p38-inhibitors may therefore serve as additional agents to prevent postoperative scarring.

References


P020 FORCE GENERATION BY TENON'S FIBROBLASTS AND SIMULTANEOUS BEHAV- IORAL IMAGING IN A DYNAMIC 3D ENVIRONMENT

A. T. cụm, G. K. K. Khan

Institute of Ophthalmology, London, United Kingdom, *Westminster University, London, United Kingdom

Purpose: To study 1. cell morphology and cell-matrix interactions during the generation of force by HTF and fibrotics and 2. the response to external tension by real-time microscopy and simultaneous force measurement.

Design: Experimental in vitro study.

Methods and/or controls: Cell contractility assay and Tenon's fibroblasts.

Results: We used human Tenon’s fibroblasts in a standard fibroblast-populated collagen matrix model based on a previously published 3D, 4D reconstructed timelapse series model of human retinal cells. Cells were characterized by immunocytochemistry and treated with TGF-β1 and matrix remodelling with phase, differential interference, and confocal reflection timelapse microscopy (Fig. 1 and 2). OpenLab and Velocity software packages were used to analyse the 3 and 4D reconstructed timelapse series.

Conclusions: Main dynamic cell contractive activity, 2 contractile force generated by Tenon's fibroblasts.

References

Purpose: Glaucoma is characterized by a progressive loss of retinal ganglion cells that results in a characteristic optic neuropathy associated with visual field loss. In previous studies changes in the vitreous have been shown in the eyes of glaucoma patients and this study aimed to determine if this could suggest a role for autoimmune involvement in the pathogenesis of glaucoma in some patients. The aim of this study was to compare the antibody profiles against optic nerve antigens in glaucoma patients to antibody profiles found in healthy subjects from both the German and the United States study population. A large similarity between all antibody profiles in both study populations could be demonstrated in the newly described autoantibody reactivity identified in glaucoma patients of both national cohorts. The multivariate analysis of discrimination found a significant difference between the glaucoma groups and healthy subjects against optic nerve antigens. As a previous study, the NPG group revealed the highest variance from controls (P<0.01). Furthermore, a newly described antibody biomarker in both study populations was identified and named.

Conclusions: We found that complex IgG antibody patterns against optic nerve antigens can be reproducibly identified in the serum of study populations from the US and Germany. Glaucoma patients have characteristic differences of serum autoantibody reactivities from healthy patients that are similar in both cohorts. A newly described autoantibody to alpha fodrin found in the serum of study populations from the US and Germany. A newly described autoantibody to alpha fodrin found in the serum of study populations from the US and Germany. A newly described autoantibody to alpha fodrin found in the serum of study populations from the US and Germany. A newly described autoantibody to alpha fodrin found in the serum of study populations from the US and Germany.

P023 REDUCTION OF VITREOUS VOLUME FOLLOWING IODATE ELEVATION WITH SUCTION CUP
C. Kooppi, C. Vass, W. Drexler, O. Findl
Medical University of Vienna, Vienna, Austria

Introduction: One theory concerning primary angle closure glaucoma (PACG) involves increased choroidal volume and poor porosity of the vitreous as two new causal factors. Vitreous contraction may be a factor that is involved in the passing through the chamber of the eye. This study presents evidence for the vitreous for contraction.

Aim of the study: To investigate the effect of short term IOP elevation and reduction on ocular structure in vivo.

Methods: Eighteen healthy volunteers participated in this pilot study. Intravascular pressure was elevated with a suction cup for 10 minutes, followed by 7 minutes with a suction cup. Measurements were performed at baseline, at every IOP elevation step and 10 minutes after removal of the suction cup. We measured axial eye length (AEL), anterior chamber depth (ACD) and lens thickness (LT) using the differences between consensual anterior and posterior light sources.

Results: Mean IOP was increased from 14 mmHg to 24 mmHg and 34 mmHg at the 2 suction levels of 10 and 12 mmHg, respectively, immediately after suction. Measurements increased significantly (P<0.05) by 4 mmHg at 14 µm and 39 ± 22 µm at the 2 suction levels and decreased by -7 ± 12 µm compared to baseline thereafter. ACD did not change during suction, but significantly increased after the end of suction by 16% at 10 mmHg and 18% at 12 mmHg. LT increased significantly by 10 mm and 20 µm over baseline. After the end of suction a minimal increase of LT of 6 ± 8 µm compared to baseline could be detected. Coefficient of variation of AEL after the end of suction may be explained by the increased choroidal volume as a result of reduced IOP. The finding of simultaneous ACD increase and reduction in the anterior chamber is in line with the authors. Increased IOP also led to increased ocular resistance that should result in reduced AV volume and thus in a reduction of ACD. The fact of simultaneous reduction of AEL and increase of ACD and LT reflects a reduction of vitreous volume. Combining the calculation of the total intraocular ocular pressure (IOP, ACD, E, AEL, E) and the effect of backward movement of the anterior vitreous surface (10 µm) the total loss of vitreous volume has been 16 ± 0% on the average. According to Quigley’s theory an increase of pressure beyond the vitreous equilibration pressure (e.g. increased at the laminar cribrosa area) increases the pressure difference between the vitreous and the posterior chamber (PC). As a consequence water exits the vitreous and enters the PC. To the best of our knowledge the data are the first direct evidence for vitreous conductivity in a living eye. This model might be used to illustrate the vitreous conductivity in patients at risk of PACG.
PO27 CORNEAL NOS-2 EXPRESSION IN SECONDARY GLAUCOMA INDUCED BY UVEITIS

I. Yücel, M. Aslan, A. Ciftcioglu, Y. Akar, Y. Yücel

Aim: To screen and sequence OPTN gene mutation in a Chinese family with Primary Open-Angle Glaucoma.

Methods: Seven DNA samples from the Chinese family including four patients were amplified by polymerase chain reaction (PCR) with four pairs of primers covering four exons of OPTN gene. Gel electrophoresis of PCR products was used to screen for size alterations. Mutational analysis of candidate genes is in progress. Open angle glaucoma, from the first presentation of the disease, was found in both parents and in 14 of 16 affected members of the family that segregates with this chromosomal region. The first report regarding a family with Glaucoma channel associated transporter 1 mutation (GLC1G) for adult-onset primary open-angle glaucoma to chromosome 2p.

References:

PO30 TO SCREEN AND SEQUENCE OPTN GENE MUTATION IN A CHINESE FAMILY WITH PRIMARY OPEN-Angle GLAUCOMA

Y.Yuan, Y. Yang, X. Hao

Harbin Medical University, Harbin, China

Objective: To investigate opticin gene (OPTN) mutation in one family in the north of China with primary open-angle glaucoma (POAG).

Methods: Seven DNA samples from the Chinese family including four patients were amplified by polymerase chain reaction (PCR) with four pairs of primers covering four exons of OPTN gene. Gel electrophoresis of PCR products was used to screen for size alterations. Mutational analysis of candidate genes is in progress. Open angle glaucoma, from the first presentation of the disease, was found in both parents and in 14 of 16 affected members of the family that segregates with this chromosomal region. The first report regarding a family with Glaucoma channel associated transporter 1 mutation (GLC1G) for adult-onset primary open-angle glaucoma to chromosome 2p.

References:

PO23 INHIBITING EFFECT OF TISSUE TRANSGLUTAMINASE(TTG) ANTISENSE OLIGONUCLEOTIDE ON CULTURED BovINE TRABECULAR MESHWORK CELLS

H. Union Tongji of Medical College, Wuhan, China

Objective: To study the effect of TTG fully phosphorylated antisense oligodeoxynucleotides (TTG-ASDGN) on expression in cultured bovine trabecular meshwork cells (BTMC) in vitro.

Materials and Methods: According to the structure of TTG-ASDGN, the phosphorothioate (P) and glycolyl (G) groups are complementary to the protein codagam region of TTG were designed, synthesized and phosphorylated. The ASDGN1 and ASDGN2 were embedded in Lipofectamine and transfected into BTMC. The untreated group is negative control. The expression of TTG in the mRNA and protein level was measured by semi-quantitative RT-PCR and immunohistochemical technique.

Results: Both the mRNA and the protein of TTG with ASDGN1 and ASDGN2 was significantly decreased compared with that of the controls (P<0.05). There is no significance difference in the expression between ASDGN1 and ASDGN2.

Conclusion: The expression of TTG mRNA and protein in cultured BTMC are down-regulated by TTG-ASDGN.

PO24 GLC1G: A SEVENTH LOCUS FOR PRIMARY OPEN ANGLE GLAUCOMA IS FOUND ON CHROMOSOME 5


Oregon Health and Sciences University, Portland, OR, United States of America

Introduction: Six loci and two genes have been mapped for Primary Open Angle Glaucoma (POAG). Two of these (GLC1C and GLC1F) were initially described in one glaucoma practice and subsequently found to be linked to the major chromosomal regions

Aim: We now describe the third genetic locus for open angle glaucoma (GLC1G) to be found in a Southeast Asian population.

Methods: Our lab has been redefined by the mapping of chromosome 5 between 104.4 Mb and 111.2 Mb to the Chinese family. This loci was shown to be within the same region as a previously described glaucoma locus.

Results: We have examined 92 members of this family and obtained blood samples. There are 14 affected members.

Conclusion: GLC1G, the seventh POAG locus has been mapped to a 3.8 Mb region on chromosome 5. Mutation analysis of candidate genes is in progress. Open angle glaucoma, from the first presentation of the disease, was found in both parents and in 14 of 16 affected members of the family that segregates with this chromosomal region. The first report regarding a family with Glaucoma channel associated transporter 1 mutation (GLC1G) for adult-onset primary open-angle glaucoma to chromosome 2p.

References:
Introduction: We have found that 17.1% of the controls had MYOC mt1 variant, while 27.3% of the POAG patients (p = 0.007) had this variant as well; at diagnosis the age and sex of patients and control were not different. MYOC mt1 carriers were older than non-carriers (56.5 ± 14.4 years vs. 51.6 ± 14.9 years, p = 0.006). The mean IOP at diagnosis did not differ between MYOC mt1 carriers (26.5 ± 3.7 mmHg) and non-carriers (25.3 ± 3.9 mmHg) (p = 0.12). When the POAG patients were compared with the controls using the paired t-test, the difference was higher in early POAG (p = 0.007) patients compared with the controls (p = 0.26). In conclusion: Our data show that in our Turkish glaucoma patients, MYOC mt1 is unrelated to risk and severity of POAG.

References:

Purpose: Primary open angle glaucoma (POAG) is a multifactorial optic neuropathy with a strong hereditary component.

Methods: We hypothesize that IL-1β (-308) promoter polymorphism (AA and GA genotypes) is associated with higher IL-1β protein level with respect to the IL-1β (-310) (GG genotype). The IL-1β gene polymorphism is suggested to be linked to the presence of chronic inflammation in different tissue types, and IL-1β is produced in the aqueous outflow pathways of the eye in glaucomatous eyes. Our previous study showed a significant increase in IL-1β expression in the trabecular meshwork in normal tension glaucoma (NTG) compared to normal eyes. 1

Conclusion: This is the first study to investigate the presence of IL-1β polymorphism in POAG patients with different stages of disease severity and it is not clear whether the IL-1β promoter polymorphism is an independent risk factor or a genetic modifier in the POAG disease.
can change the morphology of trabecular meshwork (TM) cells. This study was conducted to investigate the expression of matrix metalloproteinases (MMPs) and the morphological changes of TM cells, to verify why some steroids develop steroid-induced glaucoma more frequently than other drugs.

Design: Experimental.

Participants and for control: Four different types of steroids were used.

Method: Myofibroblasts from healthy subjects (88.9-187.7 years old) and patients with pseudoexfoliation glaucoma (67.9 ± 4.1 years, range 64-74) during extracapsular cataract extraction or trabeculectomy were obtained. Hypoxia was generated by alternating oxygen with argon gas (21% oxygen vs 0% oxygen) for 2 or 16 days, expression of bone morphogenetic proteins (BMP)-2, BMP-4, BMP-5, BMP-6, their receptors (BMPR) types I (BMPR IA, BMPR IB) and II (BMPR II), as well as activins A and B was investigated by semi-quantitative RT-PCR in biopsy specimens and in cultured Tenon's capsule fibroblasts.

Results: Hypoxia induces activation of a majority of BMPs (BMP-2, BMP-3, BMP-4, BMP-6, BMP-7) in the culture medium level of each studied molecules did not differ significantly among cells cultured with various concentrations of TGF beta2. With PMA, the TM cells (21.4 ± 7.9 vs 58.3 ± 95.8 vs 114.5 ± 48.7 ng/ml) and PMA (6.78 ± 53.79 ± 187.2 ± 19 ng/ml) with Smad signaling pathway. With TGFbeta2, TIMP-1 (101.36 ± 58.20 vs 193.45 ± 49.49 ng/ml) and the control group (m), but the difference did not reach statistical significance (Mann-Whitney test, P=0.125, P=0.142, P=0.066, and P=0.492, respectively). In both glucocorticoid and TGFbeta2 groups, MMP-1 was reduced (42% and 44% respectively, P<0.001), but no change was observed in TGFbeta2 alone (P=0.397). In combination, there was no significant difference.

Conclusions: The increase of mRNA expression in the OSTA group and the decrease in the OSTA+PMA group indicates that glucocorticoids may inhibit the expression of MMPs.

Conclusions: Cytokine expression is up-regulated in Tenon's capsule fibroblasts of human trabecular meshwork.

J.W. Kim Catholic University of Daegu, Daegu, South-Korea


P040 EFFECT OF HYPOXIA ON THE SURVIVAL AND PRODUCTION OF NITRIC OXIDE IN TRABECULAR MESHWORK CELLS

J.W. Kim Catholic University of Daegu, Daegu, South-Korea

Objective: To investigate the effect of hypoxia on the survival and nitric oxide (NO) production in human trabecular meshwork cells.

Methods: After inducing chemical hypoxia with sodium cyanide, the survival and nitrite production of the primarily cultured human TM cells were assessed with MTT and Griess assays. The effect of NO donors (sodium nitroprusside and Nacetyl-L-cysteine) alone and in combination with TGF beta 1 in the presence and absence of NO synthase inhibitor (nG-L-NAME) was also assessed.

Results: Chemical hypoxia reduced the cell viability after 24 hours exposure (p<0.05) with increased NO production. This hypoxia-induced antiproliferative effect was abolished by nG-L-NAME (p>0.05). Flow cytometric analysis revealed that hypoxia induced apoptosis of TM cells, which was induced by nG-L-NAME (p=0.05).

Conclusions: Hypoxia decreases the survival of TM cells and induced apoptosis, accompanied by increased NO production. The hypoxia-induced decreased survival of TM cells may be mediated by NO.


P041 ELEVATION OF PRIMORIAL IOP IS ASSOCIATED WITH A FALL IN EAAT1 BUT NOT EAAT2 EXPRESSION


Objective: To determine whether expression of the glutamate transporters EAAT1 and EAAT2 is altered in the retinas of primates with elevated intracocular pressure (IOP).

Methods: IOP was elevated unilaterally in cynomolgus monkeys by laser photocoagulation of the episcleral veins to generate a chronic open-angle glaucomatous model. Only one eye was laser treated. Laser was given to 5 of 14 monkeys. For immunoblot experiments, eyes were fast frozen, retinal proteins were extracted using standard techniques and the proteins were analyzed by SDS-PAGE and immunoblot technique using antibodies to EAAT1 or EAAT2 and appropriate secondary antibodies and visualized with ECL.
5. EXPERIMENTAL GLAUCOMA

5.043 ESTABLISHMENT OF A CHRONIC GLAUCOMA MODEL IN RHESUS MONKEY AND EVALUATING RELATED BIOLOGICAL CHARACTERISTICS

Eye and ENT Hospital, Shanghai, China. ²Fudan University, Shanghai, China.

Aim of the study: To establish a chronic hypotensive glaucoma model by two types of laser photoacoagulation in rhesus monkeys, evaluating the related biological characteristics in the model eye.

Methods: Laser photoacoagulation was applied to 15 adult rhesus monkeys by semiconductor laser. The aim of the study was to compare IOP changes in the model eyes with wild type monkeys that have normal eye pressure. Laser photoacoagulation was performed on the anterior chamber in homoygeneous (FP = ±11 ± 0.4) and non-homogeneous (FP = ±11 ± 2) background strain. FP: mean (±SD). After 11 days, the laser was applied to the anterior chamber at 8 am, 2 pm and 8 pm. The investigators were masked to the mouse genotype at the time of the measurement. To confirm any differences in baseline IOP values, the identical laser protocol was repeated in each mouse group. Differences of IOP were analyzed using 4 replicates for each sample. For immunohistochemical studies, tissues were perfused with 2% paraformaldehyde and sectioned at 12 microns. Sections were processed for immunohistochemistry using EAAT1 and 2 antibodies and staining was quantified as above. Staining from three regions in each eye was evaluated and analyzed.

Conclusions: These preliminary findings suggest elevated IOP does not affect expression of EAAT1 in the primate retina but is associated with a decreased expression of EAAT1. As the pressure decreased, the EAAT1 layer decreased, and this structural integrity lost in glaucoma, it is not clear whether the decrease in transporters levels is a cause or an effect of cell death.

6. CLINICAL EXAMINATION METHODS

6.040 RELIABILITY OF DIGITAL PORTABLE TONOMETER FOR INTRAOCULAR PRESSURE MEASUREMENT THROUGH THE EYELID (TGDC-01)

D. Korogianis, Sp. Georgaras, E.A. Skoufis
Ophthalmibus Athens, Athens, Greece.

Introduction: Goldmann applation tonometry is currently the most useful method in the world. But should we do when we are without a good Goldmann tonometer?

Purpose: To check the reliability of the digital portable tonometer for IOP measurements through the eyelid.

Material and methods: 1182 eyes (569 right and 613 left) from 811 patients (8 to 88 years old) had IOP measurement with Goldmann applation and with the digital portable tonometer, both measurements taken by the same opthalmologist (DK) from October 2003 to December 2004. In a study we evaluated eyes with normal ocular pressure (40 treated with Coospt, 25% Kalam and 35% combined therapy with both), primary angle closure glaucoma, neovascular glaucoma, keratocycitis, radial keratotomy, neurotrophic keratopathy, acute iridocyclitis, Posner-Schlossmann syndrome, aniridia, veimal keratocyclitis, old corneal burns, infantile juvenile glaucoma and Peter's anomaly. In some special cases, like keratophytosis, the comparison of the results was done only by finger test
due to the fact that it was impossible to take a Goldmann measurement.

Results: Comparing both IOP measurements, in the first group of eyes with an IOP range of 5 to 22 mm Hg we found no significant difference between the two methods of measurements (1 ± 4 mm Hg). However, in the second group of eyes with IOP from 24 to 60 mm Hg we found a variation of 4 mm Hg between the two tonometers.

Conclusion: The results of IOP measurements with two different types of tonometers were consistent and they were agreed in 90% of eyes with an IOP range of 5 to 22 mm Hg. The advantages of this method are a) no use of topical anesthetics b) no contact with the cornea. On the other hand, for all IOP measurements higher than 22 mm Hg the portable digital tonometer gives results that significantly vary from Goldmann tonometry.

References: 1.

6.045 COMPARATIVE RESULTS OF CENTRAL CORNEAL THICKNESS MEASUREMENTS IN PRIMARY OPEN ANGLE GLAUCOMA, PSEUDOXEFOLIATION GLAUCOMA AND OCULAR HYPERTENSION

K. Krokke, C. Pappas, S. Gomezci, A. Katkarski
University of Ioannina, Ioannina, Greece.

Introduction: Goldmann and Schmidt developed their tonometry believing that there were no significant variations in corneal thickness as clinical measurements of corneal thickness broadly available, several studies found positive correlation between corneal thickness and application measurements.

Aim of the study: To evaluate the significance of central corneal thickness (CCT) in different types of glaucoma.

Methods: We performed a non-randomized clinical trial, using a specular microscope (Model SP-2000P TopCon Corp) to assess the CCT in the following groups of patients: Group 1: 14 eyes with Primary Open Angle Glaucoma (POAG). Group 2: 38 eyes with Pseudoxefoliation Glaucoma (PXEG). Group 3: 16 eyes with Ocular Hypertension (OHT). Group 4: 52 eyes without glaucoma or any other ocular pathology (control group). To compare the results, we performed statistical analysis using t-test for independent variables.

Results: For the results showed that the CCT in Group 1 (POAG): 523.9 ± 30.2, in Group 2 (PXEG): 523 ± 1.36 mm, in Group 3 (OHT): 565 ± 4.2, in Group 4 (control group): 536 ± 23.4 mm. In the 16 cases of OHT (Group 3), CCT measurements presented statistically significant differences in values compared to all other groups. Furthermore in the 38 cases of PXEG (Group 2), CCT measurements presented statistically significant lower values, compared to those of the control group (Group 4). In the 44 cases of POAG (Group 1), CCT measurements showed no statistically significant differences in values compared to those of cases with PXEG (Group 2) and cases of control group (Group 4).

Conclusion: Our study shows that CCT was significantly thinner in cases with PXEG and significantly thicker in cases with OHT. These results agree with relative literature, strengthening the position that CCT may affect intraocular pressure (IOP) measurements.

References: 1.

6.050 IS RACE OR IRIS COLOR A DETERMINANT OF CENTRAL CORNEAL THICKNESS?

O. D. Semsa, A. W. Shahh, J. D. Bartlett, A. A. Xie
University of Alabama Birmingham, Birmingham, United States of America.

Introduction: Central corneal thickness (CCT) influences measured IOP; with a thinner CCT being associated with a lower IOP. In this study we examine if there were any differences in CCT based on race or iris color. The largest factor influencing CCT is the position that CCT may affect intraocular pressure (IOP) measurements.


Acknowledgements: Support from National Eye Institute of National Institutes of Health.
65 normal patients had IOP (Goldmann) and CCT measured. Demographic (name, DOB, race) and measured IOP were provided for all patients. The mean (±SD) CCT in NTG patients and non-glaucoma patients were 517.4 ± 19.2 µm and 524 ± 35.4 µm, respectively; p = 0.002, Student's t-test. In all five patients with unilateral uveitis, the CCT of the treated eye was smaller than that of the normal eye. The CCT of the treated eye for >2 years was significantly smaller than that of those treated for <2 years (14.9 ± 2.6 µm vs. 54.3 ± 35.4 µm, respectively; p = 0.008).

Conclusions: These results suggest that inferior cornea is independent of CCT and does not influence measured IOP. We were able to establish a relationship between race and CCT when IOP and CCT data come from the same clinic. We do report a racial difference in CCT-adjusted IOP.

References:

P047 CLINICAL COMPARISON OF REBOUND TONOMETER WITH GOLDMANN APPLANATION TONOMETER: INFLUENCE OF CENTRAL CORNEAL THICKNESS A. Alkan, S. Aka, A. Cetinayk, Y. Akova Baskent University, Ankara, Turkey

Purpose: This study was conducted to compare a new rebound tonometer (i-care, Ticaret, Finland) and the Goldmann applanation tonometer (GAT) in measuring intraocular pressure (IOP) and to evaluate the effect of central corneal thickness (CCT) on IOP measurements with these two devices.

Methods: Sixty-eight otherwise healthy subjects were tested for IOP with rebound tonometer and GAT by a single observer in random measurement sequence. The CCT was measured at a point 0.5 mm anterior to the corneal apex. CCT was measured using ultrasound pachymetry (Quantel Medical Ophthal). Participants were divided into three groups according to CCT measurements using OHTS criteria: Group 1 as CCT<555 microm; Group 2 as CCT: 555-585 microm. Group 3 as CCT>585 microm. Only the right eye measurements were used for statistical evaluation.

Main outcome measures: Assessment of accuracy of the rebound tonometer relative to GAT and evaluation of the effect of the CCT on IOP measurements by these two tonometers.

Results: The two tonometers showed strong correlation in terms of IOP measurements (r=0.76, p<0.001). Bland and Altman plots also showed a strong agreement between the two measurement techniques. The mean CCT was 559 ± 21 microm in Group 1, 566 ± 23 microm in Group 2 and 621 ± 21 microm in Group 3. The mean IOP levels measured by rebound tonometer and GAT were 14.9 ± 3.5 and 15.1 ± 3.3 mmHg in Group 1 (p=0.57), 14.1 ± 3.1 and 14.4 ± 3.0 mmHg in Group 2 (p=0.5), and 15.8 ± 4.2 and 15.6 ± 4.1 mmHg in Group 3 (p=0.18), respectively.

Conclusions: The rebound tonometer obtained with rebound tonometer were not different than those measured with GAT, and the two instruments were strongly correlated in terms of IOP levels. IOP measurements with rebound tonometer were influenced from the CCT in the same way as with GAT.


P048 CENTRAL CORNEAL THICKNESS IN EYES WITH OCULAR HYPERTECHOSION AND IN PATIENTS WITH NORMAL-TENSION GLAUCOMA. G. Dalgalarrondo, D. Guadalupe, A. Damajontaye Vitruus University Hospital, Vilnius, Lithuania

Purpose: To determine the relationship between intraocular pressure (IOP) measured with Schiotz tonometer and central corneal thickness (CCT) in eyes with ocular hypertension and nonglaucomatous eyes with IOP.

Methods: Randomised clinical trial.

Participants: Fifty-two patients (101 eyes) with diagnosed ocular hypertension and 24 persons (48 eyes) with normal tension glaucoma. The eyes were divided into three groups according to CCT measurements using OHTS criteria: Group 1 as CCT<555 microm; Group 2 as CCT: 555-585 microm. Group 3 as CCT>585 microm. Only the right eye measurements were used for statistical evaluation.

Main outcome measures: IOP measurements with Schiotz tonometer. CCT was defined by means of ultrasound pachymetry (Quantel Medical Ophthal).

Results: The mean (±SD) CCT in eyes with ocular hypertension was 591 ± 32.8 µm. In the eyes with normal IOP CCT was 519.8 ± 31.6 µm. The correlation coefficient for the CCT of Group 1 is statistically significant.

Conclusions: Eyes with ocular hypertension showed that central corneal thickness compared to eyes with normal pressure of.

References:

Main outcome measures:
- Central corneal thickness.
- OCT RNFL thickness. OCT RIm volume.
- Cup-to-disc ratio.

Results:
- Central corneal thickness measurements in glaucomatous eyes were significantly lower than those in the other groups (542.7 ± 30.3 vs. 567.1 ± 37.2 µm, p < 0.0001). Higher cataract, higher use of other glaucoma medications, and higher myopia were correlated with thinner central corneal thickness measurements (r = -0.26 P < 0.0001; r = 0.21 P < 0.0001 and r = 0.12 P = 0.0142, respectively).

Conclusions:
- Smaller corneal thickness had significantly thinner RNFL thickness values and higher cup-to-disc ratios. This finding suggests that the normal central corneal thickness is an important parameter in the clinic.

Reference:

P045 CENTRAL CORNEAL THICKNESS IN PSEUDEOXIFOLIATIVE GLAUCOMA
M.F. Dominguez, L. Torrão, D. Meira, P. Costa, F. Falcão-Reis, S. João, Porto, Portugal

Purpose:
- To compare the central corneal thickness in eyes with pseudoxfoliative glaucoma and primary open angle glaucoma.

Material and methods:
- A total of 17 eyes with pseudoxfoliative glaucoma and 17 eyes with primary open angle glaucoma were included. The study was performed using ultrasound pachymetry to measure the central corneal thickness.

Main outcome measures:
- Central corneal thickness.
- RNFL thickness.

Results:
- Central corneal thickness measurements were significantly lower in patients with pseudoxfoliative glaucoma (534.1 ± 24.1 µm) compared to glaucoma patients without pseudoxfoliation (554.6 ± 19.3 µm, p < 0.0001).

Conclusion:
- Pseudoxfoliative glaucoma is associated with thinner central corneal thickness measurements, which can be an indicator of the disease.

Reference:

P050 COMPARISON OF INTRACULAR PRESSURE MEASUREMENT BY GOLDMAN APPLANATION TONOMETRY AND PULSATILE OCULAR BLOOD FLOW ANALYSER J.I. Januleviciene, A. Harris, B. Siesky, L. McCranor, H.J. Garzozi

Eye Clinic, Kaunas University Medical College, Kaunas, Lithuania.
Department of Ophthalmology, Indiana, United States of America.
Braun Medical Ltd., Haifa, Israel.

Background:
- Intracocular pressure (IOP) is the major risk factor in glaucoma, and the measure of the functional damage in glaucoma patients but it is not a unique determinant of glaucomatous damage. Clinical assessment of glaucoma patients may not be a true reflection of the intraocular pressure. The purpose of this study was to determine the IOP differences in various types of glaucoma.

Methods:
- The study included 32 patients with primary open angle glaucoma, pseudoxfoliative glaucoma, or unilateral hypertension.

Results:
- There was a significant correlation between the IOP measurements obtained by the Goldmann applanation tonometer and the pulsatile ocular blood flow tonograph (P = 0.001).

Conclusion:
- The pulsatile ocular blood flow tonograph can be used as an alternative measure of IOP in glaucoma patients.

Reference:

P065 CLINICAL COMPARISON OF THE TONOPEN® AND ICARe® (REBOUND TONOMETER) WITH THE GOLDMAN APPLANATION TONOMETER AND THE EFFECT OF CENTRAL CORNEAL THICKNESS

Introduction:
- IOP is the most significant causative factor for glaucoma, and the measurement of IOP is the cornerstone of the management of glaucoma. The Goldmann applanation tonometer is the ‘gold standard’ of IOP measurements.

Methods:
- A total of 40 eyes were selected from the glaucoma clinic at 2001 Hospital. All patients underwent imaging and measurement with the OCT and ultrasonic pachymeter (PachScan 300P).

Results:
- Central corneal thickness measurements in glaucomatous eyes were significantly lower than those in the other groups (542.7 ± 30.3 vs. 567.1 ± 37.2 µm, p < 0.0001). Higher cataract, higher use of other glaucoma medications, and higher myopia were correlated with thinner central corneal thickness measurements (r = -0.26 P < 0.0001; r = 0.21 P < 0.0001 and r = 0.12 P = 0.0142, respectively).

Conclusions:
- Smaller corneal thickness had significantly thinner RNFL thickness values and higher cup-to-disc ratios. This finding suggests that the normal central corneal thickness is an important parameter in the clinic.

Reference:
To assess the relationship between CCT and tonometric pressure in patients with exfoliative glaucoma. The measurement of the CCT in all patients was performed with an ultrasonic pachymeter and one device was used to compare corneal thickness between groups. The IOP was measured by Goldmann applanation tonometer (GAT).

Results: In the control group the IOP was mean 16.42± 1.11 mmHg. The second group had IOP mean 16.34± 1.58 mmHg and the third group IOP mean 14.79± 1.47 mmHg. The ultrasound pachymetry findings in the control group were (mean 552.3µm [SD 33.7µm]). The second group with pseudoxofoliation showed increased IOP values (mean 578.3µm [SD 33.7µm]). The third group with pseudoxofoliation had the lowest CCT values (mean 531.0µm [SD 36.6µm]) compared to the other two groups and the difference is statistically significant (p < 0.05).

Conclusion: Our results show that the increased IOP correlates with a decrease in the CCT. IOP measurement, therefore, could be a simple, useful and sensitive method of early assessment including pseudoxofoliation. Pachymetry-measured central corneal thickness has a significant effect on the clinical management of patients with pseudoxofoliation glaucoma and glaucoma suspects.

References:

P060 COMPARISON OF THE ACCURACY OF THE TONOPEN AND SCHIOTZ TONOMETERS IN DETERMINING THE INTRAOCULAR PRESSURE IN PATIENTS WITH CONGENITAL PELPICRURUS
M. Razeghinejad 1, H. Amini 2, N. Amini 2

Introduction: The mean IOP that was assessed in normal volunteers was 19.2 ± 0.8 mmHg and 18.48±1 SDmm-Hg by Schiotz (p=0.149).

References:
after photorefractive keratectomy (PRK).

Measurement of the intraocular pressure is important in ophthalmologic practice. Goldman applanation tonometry (GAT) has become the gold standard for IOP measurements. However, photorefractive keratectomy (PRK) may reduce central corneal thickness (CCT) and result in inaccurate low intraocular pressure (IOP) measurements using Goldmann applanation (GAT) and tonometry. The new Portable Contour Tonometer (PCT) is a promising tool for measurement of intraocular pressure in unoperated eyes and eyes after LASIK.

Conclusion: PCT and GAT revealed a good correlation in IOP measurements of glaucoma and healthy eyes. In eyes with CCT < 520µm, and >550µm, IOP values using GAT and PCT did not differ statistically significantly. The new PCT is a promising tool for measurement of intraocular pressure and corneal pulse amplitude.

References:
There was a weak correlation between CCT and ST in general. This was mainly seen in patients with normal tension glaucoma, abnormal HgT with DCT and ST. The correlation between CCT and ST. The CCT was found to be thicker in OHT subjects when compared to POAG or NTG. Incidentally subjects with NTG was found to have thinner corneas when compared to normal subjects. However, when the OHT group was taken into account in respect of ST, OHT subjects have thicker ST when compared to individuals with NTG.

Results


P01.7 CIRCADIAN INTRACULAR PRESSURE IN PROSTAGLANDIN FP RECEPTOR KNOCK OUT MICE
J.G. Crowston, C.A. Morris, J.D. Lindsay, R.N. Weirebrn; Hamilton Glaucoma Center, USCD, La Jolla, CA, United States of America.

Objective: The prostaglandin (PG) FP receptor is expressed in human ocular tissues. Topical application of PGF2α analogues that activate the FP receptor lower IOP and reduce 24-hour IOP fluctuation in the human. We have recently demonstrated that aqueous humor dynamics in vivo also fluctuate in a circadian rhythm in the mouse. We have shown that the mean IOP in 3-month old C57BL/6J mice is 2.7 mmHg ± 1.2. Further IOP measurement in a larger population of FP knockout and wild type mice is necessary to confirm these results. The purpose of this study was to compare 24-hour circadian IOP changes in FP receptor knockout and wild type mice.

Methods: Wild type C57BL/6J mice (n=9) and FP receptor knockout mice (n=17) were aged 8-12 weeks and were maintained under a 12/12 hour light/dark cycle with food and water available ad libitum. The mean IOP was measured using microneedle cannulation of the anterior chamber in homozygous FP−/− mice (n=8), heterozygous (FP+/−, n=14) C57BL/6J background strain mice (FP+/+, n=11) and wild type mice (FP+/+, n=8). The intraocular pressure was measured at 8 am, 2 pm and 8 pm. The investigator was masked to the mouse genotype at the time of measurement. To confirm any differences in baseline IOP between genotypes, mid-afternoon IOP measurement was performed in a separate population of FP−/− mice (n=5), FP+/− mice (n=28) and FP+/+ mice (n=11) wild type littermates.

Results: There were no significant differences in IOP between genotypes at any of the three time points. Furthermore, there was no significant difference in the magnitude of circadian IOP variation between wildtype (mean±SEM, 1.82±0.19 mmHg) and heterozygous (FP+/−, 2.68±0.40 mmHg) mice. There was no significant difference in IOP between wildtype and heterozygous mice.

Conclusions: There was no significant difference in baseline IOP or circadian IOP fluctuation between wild-type and FP receptor knockout mice. This indicates that the FP receptor does not play a critical role in circadian IOP regulation. Supported by NIH grant EY05090.


Anterior Chamber and – Angle Evaluation

P07.02 DETECTION OF PATIENTS AT RISK OF ANGLE-CLOSURE USING ANTERIOR SEGMENT OCT - AS-OCT
W Nolan1, JS See 1, TA Aung 2, ZC Ce 3, DS Friedman 4, SD Smith 5, PT Chew 1

Purpose: To compare a new non-contact imaging method, the anterior segment optical coherence tomography (AS-OCT), with gonioscopy in the detection of occludable angles.

Methods: Patients attending the glaucoma service at the National University Hospital in Singa- pore were recruited to this preliminary study evaluating a new prototype of the AS-OCT (Zeiss Meditec, Inc, Dublin, CA, USA). All patients underwent gonioscopy using the Goldmann 2-mirror lens under dim light conditions by a single observer. The angle width was graded automatically, which is equipped with several programs for improving ACD measurement accuracy, and to investigate its accuracy for measuring ACD. The improved SPAC system can measure ACD easily with high accuracy and reproducibility. The improved SPAC system can measure ACD easily with high accuracy and reproducibility.

Results: The mean CACD in females was less than that in males (P=0.044), the mean ACV in females in was less than that in males (P=0.021).

Conclusions: The improved AS-OCT system can measure ACD easily with high accuracy and reproducibility. The improved AS-OCT system can measure ACD easily with high accuracy and reproducibility.


PO7.04 MORPHOLOGY OF CORNEAL NERVES USING CONFINED MICROSCOPY (CONFOC- SCAN) 3 IN THE OPEN ANGLE GLAUCOMA PATIENTS
L. Arriol1, S. Donati Saara2, T. Mascar0 Tommaso3, R. Pucci1, M.C. Accorinti: University of Rome ‘La Sapienza’, Rome, Italy, University of Rome ‘La Sapienza’, Rome, Italy.

Introduction: The ConfoScan 3 is a new diagnostic tool used to evaluate microscopic and morphological aspects of the cornea in vivo. We used the ConfoScan 3 (CS3) to evaluate in vivo, the corneal topography, corneal nerves and anterior chamber in glaucoma patients.

Methods: We conducted a prospective study in 46 non-glaucoma and 49 glaucoma patients. The patients were divided into healthy and glaucoma (POAG) groups.

Results: The mean variation coefficient of CACD, ACV and ACA measurements were 0.4%, 2.6% and 1.6% respectively. In healthy subjects the ACV and ACA were 0.4% and 1.6%.

Conclusions: The ConfoScan 3 is an easy and fast method to evaluate corneal nerves in vivo.

P07 TOWARDS AN OPTIMAL PERIMETRIC STRATEGY FOR PROGRESSION DETECTION IN GLAUCOMA: FROM FIXED-SPACE TO ADAPTIVE INTER-TEST INTERVALS

N.M. Jansson
University of Groningen Medical Center, Groningen, Netherlands

Purpose: To determine the optimal perimetric strategy for progression detection in glaucoma.

Design: Theoretical cohort study (thought experiment).

Methods: Two perimetric strategies for progression detection were compared by means of a thought experiment in a theoretical cohort of glaucoma patients. In strategy 1, visual field testing is performed with fixed-spaced inter-test intervals at a frequency of two tests per year. In strategy 2, the frequency of visual field testing is set to one test per year as long as the fields are apparently unchanged, whereas as soon as progression is suspected, confirmation or falsification of the suspicion is performed during the following test session within a short time span. For definite progression, two confirmations of a suspected progression were required.

Main outcome measures: The time delay between the actual progression event and the final diagnosis of definite progression, the number of visual field tests performed per year and the certainty for the patient.

Results: Average time delay between the actual progression event and the final diagnosis of definite progression was 15 months in strategy I and 6 months in the strategy 2. Maximum time delay between the progression event and the final diagnosis of definite progression was two tests per patient per year for strategy 1 and 1.45 tests per patient per year for strategy 2.

Conclusions: Perimetry in glaucoma can be optimised by postponing the next test in the case of an apparently stable field and accelerating the next test in the case of a suspected progression. This results in an earlier diagnosis, a lower perimetric frequency, and a shorter period of uncertainty for the patient.

P079 REPRODUCIBILITY OF VISUAL FIELD ENDPOINT CRITERIA BETWEEN SAP-FT AND SITA

Methods: The inter-strategy group included a randomly selected eye of 173 subjects participating in the Diagnostic Innovations in Glaucoma Study (DIGS) who had performed SAP-FT and SITA-SITA within a year before (Sequence ‘SITA&SITA’). Criteria tested: Pattern Standard Deviation (PSD)<1%; PSD<5%; Glaucoma Hemifield Test (GHT); four pattern deviation localizations (PDL); PSD<1% for each PDL; and 4 or more PDP points.

Results: Agreement was found substantial to almost perfect agreement for the inter and intra-testing strategies. Agreement was perfect for the GHT, k=1.00; for 4 or more PDP points, k=0.82; For PSD<5%, k=0.64; For 4 or more PDP points, k=0.43).

Conclusions: Inter- and intra-strategy agreement were not significantly different for the PSD and PDP criteria. Although the agreement of the GHT result was high between SAP-SITA and SITA, it was significantly lower between successive SAP-FT tests. This has implications for the clinician when switching strategies, specifically when encountering an abnormal GHT on SAP-SITA following a normal result with SAP-FT.

References:

Results: The study group had significantly less fixation loss, false positive and false negative rates as compared to controls (p<0.001).

Conclusion: Listening to Mozart seems to improve AP performance in normal naive individuals.

References:

P070 THE SENSITIVITY OF SIZE I STIMULI IN AUTOMATED PERIMETRY FOR DETECTION OF GLAUCOMATOUS VISUAL FIELD DEFECTS: A COMPARATIVE ANALYSIS WITH SHORT WAVELENGTH AUTOMATED PERIMETRY AND SITA

N. Kasahara, T.C. L. Metto, R. Cohen, M.D. Paolera, C. Manda Jr., G.V. Almeida
1Santa Casa de São Paulo, São Paulo, Brazil, 2Santa Casa de São Paulo, São Paulo, Brazil

Introduction: Early diagnosis of glaucoma is essential in order to start early treatment and prevent visual field loss. Short wavelength automated perimetry can predict the development of glaucomatous field loss in up to 5 years. Others have evaluated the diagnostic capability of automated perimetry with size I stimulus in detecting early glaucomatous field defect.1,2

Aims of the study: To evaluate the sensitivity and specificity of size I stimulus in central 24-2 full threshold automated perimetry (WW) for detection of glaucomatous visual field defects and to compare its diagnostic capability with blue-on-yellow perimetry (SWAP) and conventional size III white-on-white automated perimetry with Swedish interactive threshold algorithm (SWAP) and Swedish interactive threshold algorithm.

Methods: Twenty-five normal subjects, 24 patients with early glaucoma and 24 glaucoma suspects underwent visual field examination using standard automated perimetry (SITA) and Swedish interactive threshold algorithm (SWAP) and WW. The area under the ROC curve were calculated for each test and compared.

Results: WW was more sensitive than SWAP and SITA in the detection of early visual field defects. The area under the ROC curve for WW was 0.94 for SITA and 0.80 for SWAP, and 0.79 for WW. These differences, however, failed to reach statistical significance.

Conclusion: WW has good sensitivity for detection of early glaucomatous visual field defects. It is a good alternative in developing countries, where budgetary issues limit the acquisition of new technologies.

References:
1. Johnson CA, Adams AJ, Canssen EJ, Brand JD. Blue-on-yellow perimetry can predict the

Visual Function

P071 MODELING CHANGES IN THE VARIABILITY OF PERIMETRY RESULTS WITH SENTINEL EVENTS IN GLAUCOMA: A SIMULATION STUDY

C.A. Johnson, S.K. Gardiner, S. Demriel
Legacy Health Systems, Portland, OR, United States of America

Purpose: It has been reported that in glaucoma patients the variability of standard automated perimetry results increases as the disease progresses.1 However, these results are unclear. This study suggests a possible model for this change in the variability, and demonstrates that it fits patient test-retest data.

Methods: Prospective cross-sectional study of patient data, and simulation of modeled data.

Participants: 63 suspected glaucoma patients were tested with standard automated perimetry at 52 test locations per eyes, five times within one month (the locations of the 2-4 pattern of the Humphrey Field Analyzer, minus two points with the left eye).

Methods: A model has been produced predicting the increase in variability as sensitivity decreases. Based on this model, an algorithm was written to simulate threshold estimates obtained with the Full Threshold testing strategy. The variation in sensitivity was then defined as the standard deviation of the differences between individual threshold estimates and the average of all of five estimates at that location for that patient, for all locations whose mean was within 2dB of that sensitivity.

Main outcome measures: The correlation between the sensitivity variability relationships for simulated data and simulated data.

Results: The graph shows the variability for patient data (solid line) and simulated data (black dots) at different sensitivity levels. The correlation between them was 0.887 over the range from 3dB to 33dB. Several factors were found to affect the sensitivity variability relationship for the simulated data, most notably the rate of sensitivity decline, the percentage of false positives, and the starting position of the test procedure.

Conclusions: The model provided here has plausible explanation for the sensitivity variability relationship for glaucomatous eyes. The simulation could improve upon current methods to examine the effectiveness of different testing strategies.

References:
Purpose: Identify and characterize defects in automated perimetry test in patients with primary congenital glaucoma.

Design: Cohort study Participants and controls: Visual fields of 81 eyes (48 patients) included 15 normal eyes were analysed.

Methods: Automated perimetry test were obtained with Humphrey perimeters2 and charts of 48 patients (81 eyes) with congenital glaucoma were retrospectively analyzed: being 15 normal eyes (group N) and 66 eyes with primary congenital glaucoma (group G). The age of patients2 at the first visit was 13 ± 35 years and were grouped in eyes with early or without perimetric changes, characterized by MD > -6 dB (group G I = 41 eyes), and eyes with perimetric changes characterized by MD ≤ -6 dB (group G II = 25 eyes). Patients charts were data analyzed to determine automated visual fields characteristics and some possible correlations, according to the used criteria.

Main outcome measures: Visual acuity, reliability indices, global indices, GHT report, focal isopter index and descriptive visual field defects.

Results: The majority of patients showed good reliability. In group G I, 68% had normal focal isopter index and descriptive sensitivity. In group G II, 56% of the visual fields showed general reduction of sensitivity and 44% showed localized defects. The most common clinical feature was the inferior paracentral Scotoma. Eyes with normal visual fields in group G I had focal isopter index and MD values lower than normal eyes. The hemifield test was normal in 68% of eyes in group G I, and was abnormal 100% in eyes of group G II.

Conclusions: Automated perimetry can contribute to the initial evaluation and the follow-up of patients with congenital glaucoma.

3. Medical Center of Postgraduate Education, Warsaw, Poland, "Institute of Glaucoma, Warsaw, Poland"

Purpose: Vasospasm is considered one of the risk factors for glaucomatosus damage. It may disturb blood flow autoregulation in the optic nerve head and lead to changes in the visual field. Endothelin-1 (ET-1) is the strongest vasomotor mediator which is involved in the autoregulatory mechanism. The aim of the study was to evaluate ET-1 plasma levels in basal conditions and after cold pressor test in three groups of subjects: 1. primary open-angle glaucoma patients (POAG), 2. normal-tension glaucoma patients (NTG), 3. healthy persons, and to correlate changes of ET-1 plasma levels with changes in static perimetry results after this test.

Methods: ET-1 plasma levels were measured in basal condition and after cold pressor test (immersion of a whole hand in 4 degree C water for 2 minutes) by radioluminomassay (Amersham international). The cold pressor test was performed by 1. immersion of one hand in warm water (37°C), 2. immersion of the other hand in cold water (21°C) in the same conditions. The ‘eye-1’ was the eye tested immediately after the cold pressor test and ‘eye-2’ was tested later, about 15 minutes after cold pressor test. Results from ‘eye-1’ and ‘eye-2’ were analyzed separately. Student test, analysis of variance and Pearson correlations were used for statistics.

Results: ET-1 plasma levels – pg/ml, visual field testing – mean sensitivity, MD (dB).

Mean basal ET-1 plasma level was significantly lower in NTG group than in POAG group and control group (0.63 pg/ml vs 81.39 pg/ml vs 91.25 pg/ml). Cold pressor test resulted in statistically significant increase in mean ET-1 plasma level in all groups and this increase was significantly higher in NTG group in comparison to POAG group and control group (+43.75 pg/ml vs +28.06 pg/ml vs +24.97 pg/ml). There were no significant changes in ‘eye-1’ MS values in all groups (control: +0.31 dB, POAG: -0.53 dB, NTG: -0.5 dB). The highest increase in ET-1 plasma level after cold pressor test in NTG group was accompanied by significant decrease in ‘eye-2’ MS value (-1.06 dB vs -0.9 dB in control group and -0.72 dB in POAG group). Statistical correlation between changes in ET-1 plasma levels and ‘eye-2’ MS value changes was not found. ‘eye-2’ MS value changes were not significant in the test in the groups of POAG and NTG.

Conclusions: Results of the study indicate that ET-1 may be involved in vasospastic reactions which can influence ACD changes. The magnitude of ACD change tends to correlate with age and ACD at the entry. The relationship between ET-1 and age was not found.


Purpose: To evaluate the effect of cataract surgery on FDT perimetry in patients with co-ex- isting cataract and glaucoma. Design: Consecutive prospective cohort study.

Participants: Twenty-seven patients with open-angle glaucoma scheduled for cataract extraction were combined with trabeculectomy patients (n=16) on the same day. Methods: All patients underwent frequency doubling technology (FDT) threshold C-20 visual fields within three months before and three months after surgery.

Main outcome measures: MD (mean deviation), PSD (pattern standard deviation), and the correlation coefficient of MD and PSD pre- and postoperatively were evaluated.

Results: Twenty-two patients completed the study. VA improved after surgery, from 0.47 ± 0.19 to 0.12 ± 0.17 (p<0.001). The median number of antiglaucoma medications was 2 before surgery and 0.5 after surgery. In patients undergoing phaco-trabeculectomy (n=16) the mean IOP before and after surgery was 20.2 ± 5.0 and 15.9 ± 3.7, respectively (p=0.01). The visual field indices changed after cataract extraction: MD improved from (10.9 ± 6.9 dB to -7.0 ± 4.8 dB; p<0.001) while PSD worsened (from 7.1 ± 3.5 dB to 8.5 ± 3.8 dB; p<0.001). The extent of VA improvement correlated with the deterioration of PSD score. The Pearson correlation test showed a statistically significant correlation between the postoperative VA improvement and the PSD change (p=0.024, R = 0.478). However, the changes of MD and VA were not correlated (p = 0.252, R = 0.252).

Conclusion: In patients with co-existing cataract and glaucoma, examined with FDT, MD improved and PSD worsened after cataract surgery. Global indices of FDT should be interpreted with caution in patients with glaucoma and cataracts.

References:

P088 SHORT WAVELENGTH AUTOMATED PERIMETRY IN PATIENTS WITH PRIMARY OPEN ANGLE GLAUCOMA AND IN HEALTHY PERSONS A.A. Marinov, N.H. Petkova

Medical University Sofia, Sofia, Bulgaria, 2Medical University, Sofia, Bulgaria

Introduction: Standard Automated Perimetry (SAP) is one of the basic examination tests in routine examination of Primary Open Angle Glaucoma (POAG). SAP results were also studied as a reference in sensitivity and specificity tests. SAP and Short Wavelength Automated Perimetry (SWAP) have different wavelength threshold. Short Wavelength Automated Perimetry (SWAP) offers bigger opportunities in detecting early glaucomatous defects.

Purpose: To evaluate the visual field defects of patients with initial Primary Open Angle Glaucoma, and the visual fields of healthy persons using Short Wavelength Automated Perimetry and Standard Automated Perimetry, and to compare the results between these two tests in each group, and between groups.

Methods: A total of 36 eyes (23 patients) with POAG, and 60 healthy eyes (30 subjects), were examined. The mean age was 54 ± 9.8 years for the first group, and 43.5 ± 9.5 years for the second group. SAP and SWAP were performed in all subjects, using tests 24-2 STI Standard and 24-2 BY (SWAP) Full Threshold of HFA I 745 (Carl Zeiss, Inc.). Tests of patients with advanced glaucomatous changes were performed on SAP, while SAP best corrected visual acuity less than 1.0, 1,0, lens opacities, and these with glaucoma surgery performed were excluded from data analysis. Mean values of Mean Deviation (MD) and Pattern Standard Deviation (PSD) for SAP and SWAP were estimated, and the results were compared in each group, and between groups.

P values for compared indices were calculated. Reductions in mean values of statistical indices obtained using SWAP, were markedly greater compared with these, which were obtained using SAP in each group. Mean values of MD and PSD obtained using SWAP were greater in patients with POAG, compared to those of healthy persons.

Conclusion: SWAP is more sensitive in detecting early glaucomatous visual field changes compared to SAP.

References:
PO94 LONGITUDINAL FOLLOW-UP OF OCULAR HYPERTENSIVE PATIENTS WITH A CON- FOCSAL SCANNING LASER OPTHALMOSCOPE AND AUTOMATED PERIMETRY

Y. Akar 1, I. Yucel 1, H. Ozer 2

1. Department of Ophthalmology, School of Medicine, Antalya, Turkey, 2. Akdeniz University School of Medicine, Antalya, Turkey

Introduction: To assess the ability of a confocal scanning laser ophthalmoscope, HRT II (Heidelberg Retina Tomograph, Heidelberg, Germany) to detect early glaucomatous visual field defects.

Methods: A total of 34 ocular hypertensive patients, with a positive family history of glaucoma, were included in the study. Patients with unreliable visual field criteria, those with prior history of ocular surgery or ocular diseases (except for corneal opacity) were excluded. The patients were followed-up for one year. Complete ophthalmologic examination, visual field tests with Humphrey visual field analyser, Model 750, optic nerve head topography using a confocal scanning laser ophthalmoscope, HRT II and OCT Rim volume. Subjects underwent routine examination at baseline, and every three months during the study.

Results: The mean age of the patients (21 females, 13 males) was 34.3 ± 4.5 years (range, 22 – 51 years). Of the 34 patients, 5 patients (14.7%) demonstrated measurable glaucomatous damage by HRT II. Cup shape measure, cup volume and the neuroretinal rim area of these patients were noted to be significantly different at 6th month examination (all P values, <0.05). However, disc area and rim area as well as rim area to disc area head topographic parameters were not different during the follow-up (all P values, >0.05).

Conclusion: Cup shape measure, cup volume and neuroretinal rim area parameters may potentially herald the development of glaucomatous visual field defects in patients under high risk of glaucomatous optic neuropathy.

PO95 SPATIAL CONTRAST SENSITIVITY DEFFCTS FROM EXPERIMENTAL GLAUCOMA

R.S. Harwerth 1, G. Barnes 2, W.F. Holt 2, E.L. Smith 3

1. Department of Ophthalmology, Houston, TX, United States of America, 2. Alcon Research, Ltd, Fort Worth, TX, United States of America, 3. University of Houston, Houston, TX, United States of America

Purpose: To investigate spatial contrast sensitivity losses at high spatial frequencies in eyes with experimental glaucoma.

Methods: A total of 34 ocular hypertensive patients, with a positive family history of glaucoma, were included in the study. Patients with unreliable visual field criteria, those with prior history of ocular surgery or ocular diseases (except for corneal opacity) were excluded. The patients were followed-up for one year. Complete ophthalmologic examination, visual field tests with Humphrey visual field analyser, Model 750, optic nerve head topography using a confocal scanning laser ophthalmoscope, HRT II and OCT Rim volume. Subjects underwent routine examination at baseline, and every three months during the study.

Results: The mean age of the patients (21 females, 13 males) was 34.3 ± 4.5 years (range, 22 – 51 years). Of the 34 patients, 5 patients (14.7%) demonstrated measurable glaucomatous damage by HRT II. Cup shape measure, cup volume and the neuroretinal rim area of these patients were noted to be significantly different at 6th month examination (all P values, <0.05). However, disc area and rim area as well as rim area to disc area head topographic parameters were not different during the follow-up (all P values, >0.05).

Conclusion: Cup shape measure, cup volume and neuroretinal rim area parameters may potentially herald the development of glaucomatous visual field defects in patients under high risk of glaucomatous optic neuropathy.

PO96 SENSITIVITY OF A NEW BLUE-ON-YELLOW SPARSE MVEP IN THE DETECTION OF GLAUCOMATOUS VISUAL FIELD DEFECTS

A. Klistorner, A. Martins, S. Graham, J. Grigg, I. Goldberg, F. Bilson

Sydney University, Sydney, Australia

Objective: It is now recognized that a pattern multifocal Visual Evoked Potential (mVEP) using blue-on-yellow sparse check patterns can accurately detect glaucomatous visual field defects 1-5. The test however requires about 8-10 min of recording from each eye to reach acceptable level of signal-to-noise ratio. The aim of this study is to investigate sensitivity of a new short Blue-on-Yellow sparse mVEP (BonY mVEP) prototype in the detection of glaucomatous visual field defects.

Design: Cross-Sectional Study.

Participants: 25 glaucoma patients (age 72±10) with confirmed Humphrey visual field (HVF) defects in at least one eye and 35 age-matched normal subjects (age 68±9)

Methods: BonY mVEP used a sparse presentation of blue check patterns on a bright yellow background. Checks were centred with eccentricity, and largest test zones used such that there were now 36 zones compared to 58 for black/white mVEP. Multichannel (4) VEPs were recorded monocularly (AccuMap®). Recording duration was only 2 min per eye. All patients also underwent SWAP subjective visual fields.

Main outcome measures: Amplitude of BonY mVEP for each segment of the tested visual field and deviation plot of probability values comparing it with normal database was constructed.

Results: In the 25 glaucoma subjects, 35/60 eyes had abnormal Humphrey visual field (HVF) at 5% level. 10 eyes had normal fields. BonY mVEP detected the scotoma in all cases (100%). Of the 15 eyes with normal HVF, 2 eyes (13%) also demonstrated abnormality on BonY mVEP. Further hemifield analysis of the glaucomatous visual field demonstrated that BonY mVEP was able to detect all 10 eyes in the 10 eyes with abnormal visual field. For the 15 normal eyes, 3 additional defects were found while 10 hemifields classified by HVF as being normal were missed.

Conclusion: Our preliminary findings suggest that BonY mVEP is a viable method for fast objective detection of glaucomatous visual field defects.


PO95 PATTERN ELECTRORETINOGRAHM IN GLAUCOMA


Purpose: To correlate the pattern electroretinogram and Stratus Optical Coherence Tomography (OCT) measurements in normal, ocular hypertensive, glaucoma suspects and glaucoma patients.

Participants and methods: A total of 357 eyes were selected from a glaucoma clinic at S.João Hospital. Pattern electroretinograms (PERG) were recorded simultaneously from both eyes using standard 24-degrees pattern stimulation with 100 deg/s. Conventional 30-Hz pattern (P-30) and pattern (P-120) were recorded. The amplitude for both eyes were normalized to 100% for comparison. Results and analysis were stratified for patients with normal and abnormal perimetry.

Main outcome measures: PERG thresholds and amplitudes in each eye, and OCT Rim volumes.

Results: PERG thresholds were similar in normal, ocular hypertensive, glaucoma suspects and glaucoma patients.

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P009 MODULATION OF MULTIFOCAL ELECTRORETINOGRAM IN DIAGNOSING PRIMARY OPEN-ANGLE GLAUCOMA AND OCULAR HYPERTENSION

L. Bednarski1, K. Przybylska 2, R. Leszczynski 2, A. Wrobel 2, K. Gorski 2
L. Bednarski1, K. Przybylska 2, R. Leszczynski 2, A. Wrobel 2, K. Gorski 2

Purpose: To investigate application of multifocal electroretinogram, changes of electrical poten-
tials of second order kernel to confirm suspicions of primary open angle glaucoma and ocular hyperten-
sion.

Materials and methods: We examined both eyes of 15 subjects referred for glaucoma inves-
tigation (POAG or OHT). Ten patients with advanced glaucomatous cupping of optic nerve head mean results were compared with the control group of additionally Ophthalmoscopic Laser Scanning Tomography (TopSS) and Scanning Laser Polarimetry (Gdx) were performed. Second-order kernel of mfERG was measured by Visual Evoked Response Imaging system by ED Inc.

Results: Reduction in amplitudes and delays in the latency of inner retinal components were found in the second order kernel of normal eyes. In glaucomatous eyes, we observed prolonged amplitudes and delays in the latency of inner retinal components. Reducing amplitudes and delays of second order kernel were accompanied by a decrease in response of the ganglion cells ganglion cells. The second order kernel of the treated eye was decreased in comparison to the healthy eye. Reduction of amplitudes and delays of second order kernel were not univocal. Reducing amplitudes and delays of second order kernel were not univocal. Reduction of amplitudes and delays of second order kernel were not univocal. Reduction of amplitudes and delays of second order kernel were not univocal. Reduction of amplitudes and delays of second order kernel were not univocal. Reduction of amplitudes and delays of second order kernel were not univocal. Reduction of amplitudes and delays of second order kernel were not univocal.

Conclusions: Glaucomatous damage is known to affect the ganglion cell axon. In advanced glaucoma changes a remarkable reduction of components is observed in the second-order kernel responses. These changes do not appear to be well localized and local waves are poorly correlated with local changes in field sensitivity.

The second order kernel of the mfERG is important in measuring the inner retinal activity and is an important factor in the diagnosis of the early glaucoma cases, more objective compare to the perimetry.

P079 MULTIFOCAL ELECTRORETINOGRAPHIC (mFERG) EVIDENCE FOR PERSISTENT BUT REVERSIBLE OUTER RETINAL INJURY IN CHRONIC OCULAR HYPERTENSION

University of Wisconsin Medical School, Madison, WI, United States of America

Purpose: To test a hypothesis that outer retinal injury is a persistent feature of chronic experi-
tential ocular hypertension (OHT).

Methods: OHT was induced in eight monkeys (four rhuses and four cynomolgus) by laser scarification of the trabecular meshwork. Two of the animals had a had a previous surgical optic nerve head cupping (RHV and one cynomolgus) in the treated eye. mFERG testing was performed using VERIS Science\textsuperscript{TM} 4.9 for stimulus generation. The display consisted of a random dot-sequence (214-1) with 13.33-ms base period was used. The waveforms were digitally filtered with a variable cornea compensator and a bias retarder 5 (GDx ECC, Laser Diagnostic Technolo-
gies, San Diego, CA, USA), as well as with optical coherence tomography (Stratus OCT, Carl Zeiss Meditec, Jena, Germany).

Conclusions: Supranormality is probably an indication of neuronal injury. Its presence in both the one OHT as well as most intact eyes with OHT suggests that its origin is the outer retina (e.g., photoreceptors). A normal mFERG (OHT) from healthy retina. In OHT eyes the delayed normal outer retinal mFERG is consistent with reversible ischaemic injury to the outer retina.

References:

Structure
Objective: To evaluate the diagnostic ability of scanning laser polarimeter with variable corneal polarization compensation (GLS-VCC) for detecting glaucomatous damage.

Methods: Thirty glaucomatous eyes (mean MD: -6.4 ± 4.8) with reproducible defect on standard automated perimetry (SAP) were compared with healthy eyes' corresponding values (Mann-Whitney U-test). RNFL was scanned by commercial version of GDx-VCC (LDT, software version 2.16). The results for all optic disc sizes are seen in table 1. When evaluating all optic disc sizes, GLS-VCC showed a sensitivity of 73% and 44% with specificity of 63% and 99%. Results based on optic disc size are seen in table 2.

Conclusions: GLS-VCC has a high sensitivity for all disc sizes. For small optic discs, MRA has low sensitivity with high specificity. When the analysis is broken down by optic disc size, there is also a trade-off between sensitivity and specificity. In general the RB analysis has low sensitivity and high specificity with high specificity while MRA has high specificity with low sensitivity.


P105 DIAGNOSTIC ABILITY OF ANALYSIS TOOLS FOR DETECTION OF GLAUCOMA WITH THE CONFOCAL SCANNING LASER TOMOGRAPH (HEIDELBERG RETINOMETER II)

J.M. Larrozo, V. Polo, A. Ferras, F. Pueyo, A. Sanchez-Cano, F.M. Honrubia
Hospital Universitario Miguel Servet, Zaragoza, Spain

Aim of the study: To evaluate the performance of logistic regression formulas (LRGs) elaborated from our autoctone population (Zaragoza, Spain) by means of multivariate analysis of the topographic parameters and standard automated perimetry (SAP) performance. The receiver operating characteristic curves (ROC) and the area under curves (AUC) were computed to assess the diagnostic performance of the four multivariate formulas elaborated from our autoctone population to discriminate the presence of glaucomatous damage.

Methods: 101 normal eyes, 247 ocular hypertensive eyes and 102 glaucomatous eyes were included in study. Subjects were classified into the three groups based on intraocular pressure and standard automated perimetry (SAP) performance. The receiver operating characteristic curves (ROC) and the area under curves (AUC) were computed to assess the diagnostic performance of the four multivariate formulas elaborated from our autoctone population to discriminate the presence of glaucomatous damage.

Results: There were significant differences between normal and glaucomatous eyes in all the LRGs (p≤0.05). Ocular hypertensive eyes showed a pronounced overlap of the LRG results with respect to control and glaucoma groups. Nevertheless, when ocular hypertensives were segregated into different subsets of eyes based on clinical evaluation of the optic head or short-wavefront automated perimetry performance, the LRG ability to discriminate the presence of structural glaucomatous damage was improved. At a fixed specificity of 90% all the LRGs showed a sensitivity around 65% with AUCs greater than 0.84. A significant correlation was found between the AUCs of the LRGs and the intrasession variability of the LRG parameters.

Conclusions: The use of HRA diagnostic tools improves the diagnostic ability of HRT to discriminate healthy subjects from glaucoma patients. The use of alternative tools based on normative databases of autoctone population also improves the value of these diagnostic tools.

The observed differences within ‘limits of agreement’ were clinically important for RTA. Significant differences between HRT and RTA parameters were observed for all parameters, except for mean RNFL thickness (89%) for HRT and height variation contour (84%) for RTA. Results: The differences between HRT and RTA were superior to RTA on account of better reproducibility of measurements, better software support and shorter duration of the examination.

Conclusions: The observed differences within ‘limits of agreement’ were clinically important and the two devices cannot be used interchangeably. At present, clinical usefulness of HRT for RNFL parameter measurement is limited. Further studies are needed to determine the optimum approach for RNFL parameter measurement.

References:

111 CONPARISON OF OPTIC NERVE HEAD TOPOGRAPHY IN HEALTHY ADULTS USING HEIDELBERG RETINA TOMOGRAPH (HRT I) AND RETINAL THICKNESS ANALYSER

B. Gubser1, A. Rekic2
1University Eye Clinic Ljubljana, Ljubljana, Slovenia; 2University Eye Clinic, Ljubljana, Slovenia

Purpose: To compare optic nerve head (ONH) topography measurements acquired with Heidelberg Retina Tomograph I (HRT) and Retinal Thickness Analyser (RTA) to determine clinical agreement between the devices.

Design: Prospective observational case series.

P112 STUDY OF PATIENTS WITH OCULAR HYPERTENSION WITH SCANNING LASER POLARIMETRY AND SHORT WAVELENGTH AUTOMATED PERIMETRY

Aim of the study: To compare and correlate retinal nerve fiber layer (RNFL) measurements obtained by Scanning Laser Polarimetry (SLP) with thickness in eyes with ocular hypertension (OHT).

Results: Twenty-five eyes (26%) had SWAP visual field defects. Twenty-seven eyes (28.1%) showed 55.5 Units in Glaucomatous discs with 0 - 90 degrees PPA, 47.0 Units in Optic Discs with 91 - 180 degrees of PPA, and 23.9 Units in Optic Discs with 181 - 270 degrees PPA showing decreasing Mean TSNIT Graph. All patients had segmental glaucomatous changes and the peripapillary atrophy indicating a weakness in the segment of the Choroid/Retina and suggested that peripapillary atrophy might account for the development of normal tension glaucoma. This study found significant correlation between location of normal tension glaucoma and visual field defects. Airaksinen et al found a weak correlation between the increase in the area of peripapillary atrophy and decrease in the rim area with longterm followup. Analysis of optic nerve head topography by Jonas there may be subtle variations in white or yellowish white with yellowish white or white.

P113 SCANNING LASER POLARIMETRY IN GLAUCOMATOUS EYES WITH PERIPAPILARY ATROPHY


Results: Twenty-five eyes (26%) had SWAP visual field defects. Twenty-seven eyes (28.1%) showed 55.5 Units in Glaucomatous discs with 0 - 90 degrees PPA, 47.0 Units in Optic Discs with 91 - 180 degrees of PPA, and 23.9 Units in Optic Discs with 181 - 270 degrees PPA showing decreasing Mean TSNIT Graph. All patients had segmental glaucomatous changes and the peripapillary atrophy indicating a weakness in the segment of the Choroid/Retina and suggested that peripapillary atrophy might account for the development of normal tension glaucoma. This study found significant correlation between location of normal tension glaucoma and visual field defects. Airaksinen et al found a weak correlation between the increase in the area of peripapillary atrophy and decrease in the rim area with longterm followup. Analysis of optic nerve head topography by Jonas there may be subtle variations in white or yellowish white with yellowish white or white.

P115 SCANNING LASER POLARIMETRY OF THE RETINAL NERVE FIBER LAYER IN ALZHEIMER’S DISEASE

Purpose: To investigate senior patient’s cognitive function in Normal Tension Glaucoma with hemifield defect and to compare RNFL thickness with that of normative eyes.

Participants: Forty-eight eyes of 48 patients with chronic open-angle glaucoma with a normo- metric visual fields defects (Humphrey visual field, program SITA central 30-2) limited to superior or inferior hemifield, and 40 eyes of 40 normative subjects were enrolled in the study. The mean (± SD) of age, refractive errors, and the mean defect (MD) of visual field was 54.3 ± 11.5 years, -3.7 ± 3.0 D, -0.27 ± 3.29 dB, respectively for the glaucomatous eyes, 55.0 ± 10.9 years, -2.2 ± 2.5, -0.51 ± 1.60 dB, respectively for the normative eyes. There was no statistically significant age difference between glaucomatous and normative eyes.

Main outcome measurement: RNFL thickness between the superior and inferior sectors, and between glaucomatous and normal eyes.

Method: The SLP was performed for each eye within three months of visual field testing. After an area of a macular region, RNFL thickness (μm) was measured, and quality score was determined. Results were considered as abnormal if a quality score of eight were obtained. The superior and inferior averages of RNFL thickness were then used for analysis.

Results: In glaucomatous eyes with superior hemifield defects (21 eyes) and those with inferior hemifield defects (17 eyes), the RNFL thickness corresponding to the affected hemifield was significantly thinner than that of the apparent unaffected hemifield (p < 0.001 and p = 0.004), whereas no such a difference was observed in the normative eyes. The RNFL thickness of the unaffected hemifield in glaucomatous eyes was significantly thinner than in normative eyes (P < 0.001).

Conclusion: In glaucomatous eyes with asymmetric visual field defects limited to one hemifield, the SLP seems to detect glaucomatous damage of the RNFL in the unaffected hemifield.

References:
4. Reyes RD, Tomita O, Kizawa Y. Retinal nerve fiber layer thickness within the area of normal visual field as compared to the apparent unaffected hemifield. J Glaucoma 1998;7:329-335.

P116 ASSESSMENT OF OPTIC DISC MORPHOLOGY USING HEIDELBERG RETINA TOMOGRAPHY IN PATIENTS WITH NORMAL TENSION GLAUCOMA AND GLAUCOMATOUS VISUAL FIELD DEFECTS

Purpose: To evaluate optical disc morphology in eyes with glaucomatous dominantly having hemifield visual field defects detected using Heidelberg Retina Tomograph (HRT). To determine the cross-sectional characteristics of the cornea using the HRT and to compare the GTP angle of NRNFL thickness in patients with hemifield visual field defects detected in Humphrey 30-2 testing, respectively, and 118 eyes of 96 normal subjects were included.

Methods: All the participants were imaged using HRT (software version 3.04). Some of obtained parameters were compared among various optic disc, visual field defects detected on Humphrey 30-2 testing, respectively, and 118 eyes of 96 normal subjects were included.

Results: The participants were imaged using HRT (software version 3.04). Some of obtained parameters were compared among various optic disc, visual field defects detected on Humphrey 30-2 testing, respectively, and 118 eyes of 96 normal subjects were included.

Conclusions: The cross-sectional characteristics of the cornea using the HRT and to compare the GTP angle of NRNFL thickness in patients with hemifield visual field defects detected in Humphrey 30-2 testing, respectively, and 118 eyes of 96 normal subjects were included.

References:
Results: The authors analyzed the data from supertemporal and supranasal measurements of nerve fiber diameter. The mean measurement for normal patients was 69.1 ± 10.7 μm, while for the glaucoma group it was 60.9 ± 9.6 μm. The difference was statistically significant (p < 0.001).

Conclusions: The authors concluded that supertemporal and supranasal measurements using the GDx VCC are effective in detecting glaucomatous optic disc changes.

References:

P117 SCANNING LASER POLARIMETRY IN MYOPIC AND EMMETROPIC PATIENTS

M. Rajamaj, 1 T. Dada, 1 S. Choudhary, 1 S. Rishiota
1. Dr P.R. Center for Ophthalmic Sciences, New Delhi, India, New Delhi, India

Introduction: The nerve fiber layer analyzer uses a scanning laser polarimeter to measure nerve fiber thickness. A sensitivity of 1% and a specificity of 98% has been reported in distinguishing normal and glaucomatous patients. The main difference between pre- and post-laser measurements is that the pre-laser measurements are performed with a single laser beam and the post-laser measurements are performed with two laser beams. Therefore, the measurements are unaffected by changes in the optical properties of the cornea, such as corneal astigmatism or corneal decenteration.

Methods: The study included 100 patients, 50 with myopia and 50 with emmetropia. The patients were divided into two groups: Group A (myopia) and Group B (emmetropia). The groups were matched for age, sex, and refractive error. The patients were examined using the GDx VCC nerve fiber analyzer. The measurements were taken at two different positions: 180° rotation and 0° rotation.

Results: The mean nerve fiber thickness was 122.3 ± 15.2 μm in Group A and 125.4 ± 14.7 μm in Group B. There was no significant difference between the two groups (p = 0.12).

Conclusions: The GDx VCC nerve fiber analyzer is a reliable tool for the assessment of nerve fiber thickness in myopic and emmetropic patients. The measurements are unaffected by changes in the optical properties of the cornea.

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P120 PARAPAPILLARIS FUNUS AUTOFLOURESCENCE IN OHT, POAG, AND CONTROLS

A. Viestenz 1, A. Langenbucher 2, R. Lämmer 2, G.O.H. Naumann 2, C.Y. Mardin 2
1. Department of Ophthalmology, Erlangen, Germany, 2. University Erlangen-Nürnberg, Erlangen, Germany

Introduction: Electron microscopy has revealed a pronounced amount of lipofuscin in the retinal pigment epithelium cells in parapapillary atrophic zone in eyes with high pressure glaucoma. Lipofuscin is one of the main detergents of fundus autofluorescence and can be visualised using fundus autofluorescence imaging.

Methods: We performed a case-controlled cross-sectional prospective study of 200 consecutive eyes (69 controls, 59 OHT, 72 POAG). Detection of PAF with a confocal scanning laser ophthalmoscope (Heidelberg Retina Tomograph II, HRT II) was performed. The PAF measurement was compared with the Heidelberg standard imaging software. Additional measurements were: visual field test, 24 h-intraocular pressure profile, central corneal thickness (Tomey, AL-2000 pachymeter), and 15° slit lamp fundus photography (Kowa, F-14 fundus camera). The PAF was defined as a decrease in the Heidelberg standard imaging software. All subjects had a history of a pars plana lens extraction and no intraocular inflammation.

Results: The mean age of the subjects was 66.3 ± 15.7 years. The mean intraocular pressure was 16.9 ± 4.8 mm Hg. The mean visual field defect was 5.7 ± 4.2 dB. The mean PAF area was 0.05 ± 0.08 mm². The mean central corneal thickness was 529 ± 54 μm. The mean 15° slit lamp fundus photography was 2.4 ± 1.5. The mean PAF was significantly different between the groups (p<0.001).

Conclusions: The PAF was smaller in eyes with POAG than in controls and in eyes with OHT. The PAF was significantly different between the groups (p<0.001).

P122 OPTIC NERVE HEAD TOLERANCE TO THE INCREASE OF INTRAOCULAR PRESSURE IN HEALTHY VOLUNTEERS, OCULAR HYPERTENSION AND PRIMARY OPEN ANGLE GLAUCOMA PATIENTS.

E. Akopov, V. Yatskov
Pavllov State Medical University, St.-Petersburg, Russian Federation

Purpose: The purpose of the study was to assess the optic nerve head (ONH) stability in measured short-term intraocular pressure (IOP) increase in healthy volunteers, patients with ocular hypertension, and primary open angle glaucoma (POAG) patients. Sixty volunteers were divided in two age groups: from 16 to 35 years (87 people) and from 36 to 74 (125 people). The group of patients with a history of POAG was composed of 87 participants. The study included the third, fifth, eighth, and tenth years after the initial POAG and with initial POAG in the last one. The mean cup depth (MCD) of the optic disc was evaluated with the Heidelberg retina tomograph (HRT II). After baseline examination surgery was used to increase IOP for 10 mm Hg above baseline and MCD was determined again. OIC level was controlled by Perkins’ tonometer before and during surgery. IOP increase resulted in MCD increase in all cases. In group 1 mean MCD increase was 19.7 ± 4.05 mm. In OHT group MCD mean increase was 49.1 ± 8.13 mm. The difference of this value was statistically significant when compared with that in the groups 2 and 3 (t=3.58, p<0.05). There was no correlation between IOP increase and age in healthy people.

Results: The investigation permits to establish criteria of normal and decreased stability of ONH to the induced elevation of IOP: we consider the MCD increase less than 25 mm as normal, (outside normal limits), 44 for inferior average of GDx and 12.4 for average thickness in OCT.

Conclusions: Our results suggest that glaucoma patients have a lower tolerance to IOP increase.

References:

P123 COMPARISON OF HEIDELBERG RETINA TOMOGRAPH (HRT II), SCANNING LASER POLARIMETRY (GDx VCC) AND STRATUS OPTICAL COHERENCE TOMOGRAPH (CCT) IN THE DIAGNOSIS OF EARLY ELMICLA GLAUCOMA IN INDIAN EYES

S. Garudadri, R.S. Kumar, B. Arumugham, A.S. Prasad
Ly Prasad Eye Institute, Hyderabad, India

Introduction: Studies on structure and function correlation in glaucoma have shown that structural changes of the optic nerve head usually precede functional changes as determined by automated perimetry. GDx has been widely used for this purpose.

Methods: Twenty two normal eyes (61.1%) were diagnosed as non-glaucoma and 82 glaucoma eyes (38.9%) were diagnosed as glaucoma.

Results: Twenty two normal eyes (61.1%) were diagnosed as non-glaucoma and 82 glaucoma eyes (38.9%) were diagnosed as glaucoma.

Conclusions: This is the first study in a Chinese population, and to investigate the retinal nerve fiber layer (RNFL) thickness differences between normal subjects and glaucoma patients.

P124 SPECIFICITY AND SENSITIVITY IN DIAGNOSIS OF GLAUCOMA BY SCANNING LASER POLARIMETRY AND OPTICAL COHERENCE TOMOGRAPHY IN CHINESE POPULATION.

Yi Jiang, XD Duan, ZL Luo
Hunan Xiangya Hospital, Changsha, China

Objective: To evaluate the usefulness of the scanning laser polarimeter with variable corneal compensation in the diagnosis of glaucoma.

Methods: Thirty six 36 normal subjects, 33 eyes of 33 primary chronic angle-closure glaucoma patients. 27 eyes of 27 primary acute angle-closure glaucoma and 36 eyes of 36 primary open-angle glaucoma patients were studied. The glaucoma patients were age-matched with the normal. The thickness of retinal nerve fiber layer was measured by GDxVCC. An eye was diagnosed as glaucoma, if one of the parameters showed P<0.05 on the results of the examination reports including four TSNT parameters (the average of TSNT, superior, inferior, and both TSNT Std. Dev.), nerve fiber indicator (NFI) >30, and at least 10 consecutive defects of superpels showed in deviation map (P<0.05).

Results: Twenty two normal eyes (61.1%) were diagnosed as non-glaucoma and 82 glaucoma eyes (38.9%) were diagnosed as glaucoma.

Conclusions: This is the first study in a Chinese population, and to investigate the retinal nerve fiber layer (RNFL) thickness differences between normal subjects and glaucoma patients.

P125 NERVE FIBER LAYER MEASUREMENTS USING THE GDx VCC IN MONKEYS.

C.A. Rasmussen, J.C. Peterson, P. Zhang, J.S. Klein, S.P. Kaufman
University of Wisconsin, Madison, WI, United States of America

Purpose: To determine the feasibility of using the GDx VCC system with monkeys to evaluate reproducibility.

Methods: One normal eye from each of nine cynomolgus monkeys was studied. Monkeys were anesthetized with a combination of intra-muscular ketamine and medetomidine, followed by inhalation isoflurane. Monkeys were maintained at, or near, surgical anesthetic depth for the scanning procedure. GDx (Goldmann application tonometer), corneal curvature (Reichert keratometer) and refraction (Hartinger coincidence) were measured at each session. Slit lamp examination was performed to assess corneal transparency and the presence of edema, anterior chamber, KP etc), GDx-VCC parameters of average thickness, superior integral, ellipse average, superior ratio, inferior ratio and superior/nasal ratio had values of 87.4%, 95.83%, 100% respectively. Ratio parameters superior/nasal ratio had values of 71.7, 10.7 and 10.2% respectively. Modulation parameters were the most variable, ranging from 11.6 to 15.7%.

Results: Collecting multiple, discrete intrasession scans and creating a mean of these values can help compensate for intraexamination measurement variation inherent to the GDx VCC (www.globa.org)
P127 AGREEMENT AMONG THREE OPTICAL IMAGING METHODS FOR THE ASSESSMENT OF OPTIC DISK TOPOGRAPHY. E. Hoffmann1, C. Boyd1, L.M. Zangwill1, C. Boden1, F.H. Gruz1, R.R. Bouna1, R.N. Weinreb1. 1Department of Ophthalmology, University of California of San Diego, La Jolla, CA, United States of America, 2University of Mainz, Germany

Introduction: Assessment of optic disk topography is essential for diagnosis and management of glaucoma. Several optical imaging methods are currently employed in clinical practice to obtain quantitative and semi-quantitative topographic information of the optic disk. Each of these instruments can detect glaucoma with high reproducibility. Although these instruments measure topographic features of the optic disk topography, their measurements may be interpreted differently.

Purpose: To assess the agreement of disk topography measurements among Heidelberg Retina Tomograph (HRT), Retinal Thickness Analyzer (RTA), and the Optical Coherence Tomograph (Stratus OCT).

Methods: Forty-two randomly chosen eyes of 42 subjects (23 glaucoma patients, and 19 normal subjects) were included. Each subject underwent HRT, RTA, and Stratus OCT. Two experienced examiners drew the contour lines for HRT and RTA while viewing simultaneous stereophotographs. A multivariate analysis of variance with mixed model was used to assess agreement.

Results: There were no significant differences in mean disk area was found among the instruments. Although HRT had a slightly larger disk area (Reference = 10.05 mm²; HRT = 10.61 mm²; RTA = 10.26 mm²; OCT = 10.36 mm²), the difference was not statistically significant for two devices. Comparison among devices with RTA and OCT were also statistically significantly.

Conclusions: Measurements of optic disk topography using these three imaging devices can show similar result. However, the agreement for area, disk volume and disc cupping was not statistically significant.

P128 OPTIC NERVE HEAD MEASUREMENTS USING OPTICAL COHERENCE TOMOGRAPHY AND CONFOCAL SCANNING LASER OPHTHALMOSCOPY. M. Tavares, M.Y. Endo, L.M Guedes, A.A. Barbosa, L.A.S. Melo, P.A. Mello. 1Hospital das Clínicas, São Paulo, Brazil, 2Marcelo, São Paulo, Brazil, 3São Paulo, Brazil

Introduction: Recent improvements in the OCT technology have made possible the evaluation of the optic nerve head in vivo. A previous study1 demonstrated that OCT can be used to measure optic nerve head parameters. However, it is unknown whether these measurements correlate well with topographic measurements obtained by confocal scanning laser ophthalmoscopy.

Purpose: To compare monoscopic digital photography optic cup-to-disc ratio measurements with Stratus OCT and stereoscopic 60D indirect lens ophthalmoscopy results.

Methods: Forty-two randomly chosen eyes of 42 subjects (23 glaucoma patients, and 19 normal subjects) were included. Each subject underwent OCT, monoscopic digital photography and 60D indirect lens ophthalmoscopy. The Fast Optical Disk scan protocol was used to obtain measurements of the optic disk for glaucoma diagnosis or to monitor progression.


P129 RETINAL NERVE FIBER THICKNESS MEASUREMENT USING GXD WITH ENHANCED CORNEAL REFLECTION. A. Tomidosako, H. Saito, G. Tomita, M. Ahara, M. Arau University of Tokyo, Tokyo, Japan

Objective: GDx with Enhanced Corneal Compensator (GDX ECC) is a new program designed to make more accurate measurements of the retinal nerve fiber layer thickness (RNFLT) compared to the former program, GDx with Variable Corneal Compensator (GDX VCC). With the ECC, the path length of light that passes through the tissue is estimated from the laser reflectivity. To correct for optical distortions caused by the cornea, the GCC images are compared to GCC images obtained by the same system with GCC. With the ECC, the GCC images are compared to GCC images obtained by the same system with GCC. With the new version, Staf-OCT (Carl Zeiss Meditec, Inc, Dublin, CA, USA) includes several improvements compared to the previous version, including an improved corneal surface and macular thickness measurements.

Aim of study: To evaluate and compare the ability of peripapillary RNFLT measurements, macular thickness measurements and optocor thickness measurements by Staf-OCT to discriminate between normal and glaucomatous eyes.

Methods: Cross-sectional observational analysis of twenty-seven patients with glaucoma using VCC, with SD and 35 healthy participants with similar age, RNFL thickness measurements and optic disc measurements were obtained from all subjects by im-
aging with: “Fast RNFL thickness”4, 14 “Fast Macular Thickness Map” and “Fast Optical Disc” scans. Fast acquisition parameters for OCT. Visual field testing was performed on average once every three months. Results: Area under the ROC curve (AUC) for Stratus OCT RNFL thickness measurements ranged from 0.79 to 0.90 for normal control individuals and 0.87 to 0.93 for glaucomatous eyes, respectively. Conclusions: The Stratus OCT RNFL thickness measurements are reliable, reproducible, and of high diagnostic value for the early detection of retinal nerve fiber layer damage in patients with glaucoma.

P135 DIAGNOSTIC & CORRELATION ANALYSIS OF STRATUS OCT AND GDx VCC RGoldelman F., Brusini P.1, M.L. Salvetat 1, M. Zeppieri 2, C. Tosoni 1, L. Parisi 1, M. Felletti 2

1Santa Maria della Misericordia Hospital, Udine, Italy, 2Dept. of Ophth.-Univ. of Udine, Udine, Italy

Purpose: To compare Stratus OCT measurements in normal subjects, ocular hypertensive (OHT) patients, and in patients with early open angle glaucoma (POAG) with OCT. Design: Observational case series. Participants: Seventy-nine healthy subjects, 82 OHT patients and 90 early POAG patients. Methods: This study was conducted between January 1st, 2003 and December 31st, 2004. OCT scans were performed on both eyes of the patients. The AORC standards for the assessment of the different RNFL parameters were established. Results: The AUCs of the ROC analysis for detection of OHT and POAG eyes were 0.95 and 0.93, respectively. In OHT patients, the AUCs ranged from 0.82 to 0.88, and in POAG patients, from 0.82 to 0.93. The AUCs of the ROC analysis for detection of early glaucoma were 0.93 and 0.92, respectively. Conclusions: The Stratus OCT is able to discriminate between healthy and early glaucoma eyes. The RNFL scan parameters are useful in recognizing very early structural alterations in glaucoma patients and in early POAG patients.

P136 DETECTION OF GLAUCOMATOUS DAMAGE WITH OPTICAL COHERENCE TOMOGRAPHY (OCT)\n
J.M. Larrosa, V. Polo, A. Ferras, C. Mayoral, V. Puyou, F.M. Horruba

Hospital Universitario Miguel Servet, Zaragoza, Spain

Aim of the study: To compare the thickness of retinal nerve fiber layer (RNFL) measured by spectral domain optical coherence tomography (OCT) with fast short wavelength perimetry (S-wavelength) in patients with different forms of open angle glaucoma at different time points and evaluate the predictive value of the different RNFL measurements for detecting advanced stages of the disease. Methods: Patients with open angle glaucoma (MD<6dB) were examined with the HRT II and the Octopus 311 perimetry system. Results: The AORCs for the Stratus-OCT-parameters ranged between 0.52 and 0.88, with a median of 0.71. Differences amongst groups were evaluated using the Mann-Whitney test and the Kruskal Wallis test. The AORCs for the Stratus-OCT-parameters were between 0.52 and 0.74 and for the OCT RNFL thickness 0.74. The best OCT RNFL parameter for glaucoma detection was the horizontal integrated rim width (area under the ROC curve = 0.94). Conclusions: The Stratus OCT is a valid tool for detecting glaucomatous damage. The OCT RNFL thickness is a promising parameter for detecting early glaucoma.


“Santa Maria della Misericordia Hospital, Udine, Italy, Dept. of Ophth.-Univ. of Udine, Udine, Italy

Purpose: To compare Stratus-OCT measurements in normal subjects, ocular hypertensive (OHT) patients, and in patients with early open angle glaucoma (POAG) with OCT. Design: Observational case series. Participants: Seventy-nine healthy subjects, 82 OHT patients and 90 early POAG patients. Methods: This study was conducted between January 1st, 2003 and December 31st, 2004. OCT scans were performed on both eyes of the patients. The AORC standards for the assessment of the different RNFL parameters were established. Results: The AUCs of the ROC analysis for detection of OHT and POAG eyes were 0.95 and 0.93, respectively. In OHT patients, the AUCs ranged from 0.82 to 0.88, and in POAG patients, from 0.82 to 0.93. The AUCs of the ROC analysis for detection of early glaucoma were 0.93 and 0.92, respectively. Conclusions: The Stratus OCT is able to discriminate between healthy and early glaucoma eyes. The RNFL scan parameters are useful in recognizing very early structural alterations in glaucoma patients and in early POAG patients.

References:

3. Zangwill LM, Bowd C, Webster RG, et al. Quantitative RNFL measurements using OCT showed differences between normal, ocular hypertensive and glaucoma eyes. J Glaucoma 2003; 12: 45-49.4. Medeiros FA, Zangwill LM, Bowd C, et al. Evaluation of rhodamine green and strain optical nerve head (ONH) scans were performed, using the Fast RNFL Thickness 3.64 and Fast Optical Disc protocols, respectively. Differences amongst groups were evaluated using the Mann-Whitney test and the Kruskal Wallis test. The AUC for the Stratus-OCT-parameters was 0.93 and for the OCT RNFL thickness 0.92. The best OCT RNFL parameter for glaucoma detection was the horizontal integrated rim width (area under the ROC curve = 0.94). Conclusions: The Stratus OCT is a valid tool for detecting glaucomatous damage. The OCT RNFL thickness is a promising parameter for detecting early glaucoma.

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Primary open angle glaucoma is a multifactorial optic neuropathy in which there is characteristic acquired loss of optic nerve fibers. A significant axonal loss may precede the development of glaucomatous visual field defects and identifiable cupping.

Methods and study: To detect early structural glaucomatous changes at the retinal nerve fiber layer (RNFL) and the macula in subjects with risk factors for POAG (ocular hypertension and positive family history - first grade relatives).

Results: Among 96 subjects with a positive family history of POAG were selected 30 subjects (59 eyes) (14 males and 16 females; mean age 52.2 ± 10.1y) with IOP>22mmHg (mean IOP 23.4 ± 1.3), normal visual-field and normal optic disc appearance. They underwent a complete ophtalmological examination including normal optic disc, visual field test, and Goldmann perimeter. Quantitative analysis of the retinal nerve fiber layer (RNFL) and the macular thickness/Volume were performed with OCT and OCTA respectively in retinal small subjects age and sex matched. The linear correlation analysis was carried out with Student t test, Pearson's correlation coefficient, sensitivity and specificity (AROC); p<0.05 were considered statistically significant.

Conclusions: In eyes of glaucomatosus patients relative risk factors reducing in the RNFL. Thick-ness was found (96.8±15.5µ vs 11.8±16.7µ; p<0.01) in the sector-by-sector analysis showed statistical significant differences in the RNFL thickness in all locations analyzed (p<0.01). No statistical differences were found in macular thickness/volume (global and sector-by-sector analysis) between cases and controls. Significant correlation was found between macular volume and RNFL thickness (r=0.41). RNFL thickness Average produced the largest area under ROC curves (0.79).

Purpose: In eyes of patients with positive family history for POAG associated to ocular hypertension with normal SAP and normal appearance of optic disc the RNFL is thinner than in normal subjects. The OCT 3 analysis permits an earlier detection of structural glaucomatous changes by using OCT analysis in patients at risk of developing POAG.

Methods: A total of 60 patients (119 eyes) who had localized RNFL defects of either eye were included in the study. The OCT examinations were performed in the following four groups: 1) healthy controls; 2) patients with ocular hypertension; 3) patients with glaucoma suspects and 4) glaucomatous patients.

Results: The OCT results were compared with that of Stratus OCT and HRT II. In the results of Stratus OCT and HRT II the percentage of patients with significant defects by the new normative database, and the defect accorded with the location of visual field defect in glaucomatous patients.

Conclusions: 1. The OCT results were compared with that of Stratus OCT and HRT II. In the results of Stratus OCT and HRT II the percentage of patients with significant defects by the new normative database, and the defect accorded with the location of visual field defect in glaucomatous patients.

References:


Purpose: To evaluate and compare the thickness of retinal nerve fiber layer (RNFL) measured by Stratus OCT, glaucoma damage evaluation system 2, and an algorithm developed by the research team of the retinal nerve fiber layer. Measurements and main outcome measures: The results of HRT II were in accord with 67.2% in superotemporal portion and 68.9% in inferotemporal portion (lateral nasal hump pattern graphs with percentile distribution color bands as seen in STarrant OCT). The percentile distribution confidence bands were bordered at 1%, 5%, and 95%. The corrected database was applied to seven preperimetric normal-tension glaucoma patients with RNFL defects in red free photographic images and to normal RNFL results by conventional normative database.

Conclusions: This preliminary result shows the possibility that by customizing normative database according to the race difference, the false negative detection rate of OCT for early glaucoma may be lowered.

References:


P143 CORRELATION BETWEEN STRATUS OCT AND HRT II IN EARLY GLAUCOMA J. Kim, K.H. Park, S.H. Kang, T.W. Kim, D.M. Kim

1. Kangbuk Samsung Hospital, Seoul, South-Korea, 2'Seoul National University, Seoul, South-Korea, 3'Bundang SNU Hospital, Keonggi-do, South-Korea

Purpose: To evaluate the ability of Stratus OCT and HRT II to detect localized RNFL defects and the accuracy of the results of Stratus OCT and HRT II in glaucoma patients.

Design: Non-randomized, cross-sectional study.

Participants: A total of 60 patients (119 eyes) who had localized RNFL defects of either eye in red-free photographic images were examined. Methods: A total of 60 patients (119 eyes) who had localized RNFL defects of either eye in red-free photographic images were examined. The diagnostic abilities of Stratus OCT and HRT II to detect localized RNFL defects were calculated. The results of HRT II were compared with that of Stratus OCT.

Main outcomes/results: The overall sensitivity, specificity, positive predictive value and negative predictive value to detect localized RNFL defects were 68.2%, 86.1%, 84.3% and 76.3% in Stratus OCT and 67.3%, 65.9%, 62.2% and 69.6%, respectively. A comparison with Stratus OCT, the ratio of HRT II were in accord with 67.2% in superotemporal portion and 68.9% in inferotemporal portion. The accuracy of detection of RNFL defects between 2 instruments in inferotemporal portion is higher (79.2%) than others.

Conclusions: Stratus OCT layer-by-layer comparative database is a useful tool to detect localized RNFL defect in early glaucoma. If observation of topographic change of optic disc with HRT II is added, it will be better.

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P144 REPRODUCIBILITY OF STANDARD AND FAST ALGORITHMS OF OCT III NEURAL FIBER LAYER THICKNESS AT 3.4 MM. A. Antoni, R. Cuadrado, A. Flores, F. Blazquez, J. Moreira, V. Pitar, M. Barton CIB, Valladolid, Spain; "Clinica Univ. de Navarra, Navarra, Spain; "Hospital Miguel Servet, Zaragoza, Spain

Introduction: OCT III is capable of producing objective measures of the retinal nerve fiber layer (RNFL) and is able to discriminate between normal and glaucomatous eyes. OCT III offers the advantage of fast imaging (fast and standard) and their reproducibility and classification results have not been compared yet.

Purpose: To assess and compare the reproducibility of OCT nerve fiber layer (NFL) parameters obtained with the different algorithms-HRT II, Topcon confocal scanning laser ophthalmoscopy and OCT III at 3.4 mm. Method: Cross sectional study. Thirty one eyes (9 normal, 11 ocular hypertensive [OHT], 2 suspects and 9 glaucomas) of 16 subjects were included in this study. A complete ophthalmic examination including colour disk photographs and reliable standard visual field (Humphrey-SITA 24-2) OHT has OCT over 20 min, normal diptas and normal fields. Glaucomas were only included if FOP was over 20 mmHg, and had glaucomatous changes in both eyes. Nerve Fiber Layer (NFL) was as-essed with OCT III using two different algorithms of the protocol RNFL Thickness 3.4. Fast algorithm was used to evaluate OCT reproducibility, coefficient of variation, among three different images of each algorithm, was calculated for the following parameters: average thickness, super-ior thickness and inferior thickness. OCT III normative database offers automatic classification for the 6 standardisation limits (60% to 90% limits and 60% to 90% limits [95% limits]).

Results: Mean coefficient of variation for average thickness, superior thickness and inferior thickness is shown in table 1. In 10 eyes (15%) there was a change in the classification at least in one parameter. Table 2 shows the number of eyes with a classification change in each of the three parameters. Table 2 shows the number of eyes with a classification change in each of the three parameters. Conclusion: OCT III in both fast and standard algorithms shows good reproducibility and classification results, although classification change occurred among different images of the same eye.


'Caritas Medical Centre, Sham Shui Po, Hong Kong' 'The Chinese University of HK, Shatin, Hong Kong'

Purpose: To evaluate the structural-functional relationship between the retinal nerve fiber layer thickness (RNFLT) measured by Optical Coherence Tomography and the visual field(VF) sensitiv-ity.

Design: Cross sectional study.

Participants: A total of 89 subjects with 27 normal, 21 glaucoma-suspect and 41 glaucoma eyes were included.

Methods: RNFLT was measured by Stratus OCT and VF was examined with Humphrey Visual Field. OCT3 and VF were measured using SITA standard 24-2, thickness expressed in mm. RNFLT, the unglified 1T, and the AGIS and the CIGTS VF scores, were evaluated with linear and non- linear regression. Mean RNFLT was compared with a non-linear regression for each parameter and algorithm. Average RNFLT classification changed more frequently, among the 3 images of the same eye, with Fast algorithm (3.3%) than with Standard algorithm (5.1%). Classification changes occurred more frequently with algorithms in which RNFLT was assessed with both eyes of the same individual. Nonetheless, classification change occurred among different images of the same eye.

Results: Plotting MD against RNFLT, the 2nd order polynomial demonstrated the best fit in the regression analysis (Figure 1A) while linear regression (the 2nd order polynomial, the 3rd order polynomial, the 1st order inverse and the F test). As a result, the best fit was obtained using the regression profiles found between RNFLT and CIGTS VF scores / MD support those longitudinal studies in demonstrating the increased severity of baseline MD or VF scores have higher risks of functional deteriora-tion. Several studies show that structural damage (reduction in RNFLT), the increased severity of the unglified 1T, and the AGIS and the CIGTS VF scores, were evaluated with linear and non- linear regression. Mean RNFLT was compared with a non-linear regression for each parameter and algorithm. Average RNFLT classification changed more frequently, among the 3 images of the same eye, with Fast algorithm (3.3%) than with Standard algorithm (5.1%). Classification changes occurred more frequently with algorithms in which RNFLT was assessed with both eyes of the same individual. Nonetheless, classification change occurred among different images of the same eye.

Conclusions: The description of the structural-functional relationships in glaucoma is dependent on the choice of expressions of VF sensitivity. The curvilinear regression profiles found between RNFLT and CIGTS VF scores / MD support those longitudinal studies in demonstrating the increased severity of baseline MD or VF scores have higher risks of functional deteriora-tion. Several studies show that structural damage (reduction in RNFLT), the increased severity of the unglified 1T, and the AGIS and the CIGTS VF scores, were evaluated with linear and non- linear regression. Mean RNFLT was compared with a non-linear regression for each parameter and algorithm. Average RNFLT classification changed more frequently, among the 3 images of the same eye, with Fast algorithm (3.3%) than with Standard algorithm (5.1%). Classification changes occurred more frequently with algorithms in which RNFLT was assessed with both eyes of the same individual. Nonetheless, classification change occurred among different images of the same eye.


'UCSD - Hamilton Glaucoma Center, La Jolla, CA, United States of America, 'Fed University of Sao Paulo, Sao Paulo, Brazil

Introduction: Optical coherence tomography is an optical imaging technique that provides reproducible images of the retinal nerve fiber layer (NFL). In scanning laser polarimetry, the retin a and in and around the optic nerve head is probed with polarized light to detect RNFL phase retardation, which is converted to RNFL thickness.

Purpose: To compare the RNFL thickness obtained using scanning laser polarimetry with variable cornea compensator (GDx-Vcc) and optical coherence tomography (Stratus OCT) in glaucoma patients.

Methods: Twenty-nine eyes of eighteen patients were included. The patients had glaucoma, best-corrected visual acuity of 20/60 or better, neither significant media opacity nor other significant ocular disease. Peripapillary RNFL thickness was obtained by GDx and OCT using circles with a 1.4-mm, 1.8-mm and 2.2-mm radii. The normal limits were set as the upper 95% of the distribution.

Results: The Lin’s concordance correlation coefficients between OCT and GDx measurements at 1.4-mm, 1.8-mm and 2.2-mm radii circles were 0.70 (P<0.05), 0.56 (P<0.05) and 0.11 (P>0.05), respectively. The mean differences between OCT and GDx measurements at 1.4-mm, 1.8-mm and 2.2-mm radii circles were 42.35 µm (95% Confidence Interval 37.46 to 47.25 µm; P<0.001), 31.05 µm (95% CI: 26.73 to 35.36 µm; P<0.001) and 24.50 µm (95% CI: 19.99 to 29.00 µm; P<0.001), respectively. The OCT and GDx measurements were not correlated at 1.4-mm, 1.8-mm and 2.2-mm radii circles.

Conclusions: There is poor agreement between OCT and GDx RNFL measurements in glaucomatous patients. The RNFL thickness obtained using Stratus OCT is about two-fold larger than the RNFL thickness obtained using GDx-Vcc.

P149 GLAUCOMA DIAGNOSIS USING STRATUS OPTICAL COHERENCE TOMOGRAPHY

H.Y. Chen, M.L. Huang, P.T. Hung
‘China Medical University Hospital, Taichung, Taiwan, ‘Chien-Yi Institute of Technology, Taichung, Taiwan.

Introduction: Changes in the structural appearance of the optic nerve head (ONH) have been recognized as early predictors of glaucoma (‘Diagnostic criteria’). It has been shown that the retinal nerve fiber layer thickness and macular thickness measurements for glaucoma detection using optical coherence tomography. J Am Ophthalmol 2005;139:44-55.

Aim of the study: We differentiated between normal and glaucomatous eyes in a Chinese population and investigated the use of optical coherence tomography (OCT) data by comparing their area under the receiver operating characteristic curve (AUC).

Methods: Eighty-two glaucoma patients (mean deviation: 5.14 ± 5.61dB) and 88 normal individuals were included. (Table 1) Informed consent was obtained from all subjects. The results are expressed as mean ± standard deviation.

Results: Table 2 shows the results of 23 input parameters from Stratus OCT in both groups. Table 3 shows the area under the receiver operating characteristic curve (AUC) calculated for each parameter.

Discussion: The largest area under the receiver operating characteristic curve (AUC) was achieved for nasal quadrant thickness (AUC=0.84), followed by the macular thickness parameter (AUC=0.83). The lateral aspect of the ONH parameter had a significantly larger AUC than the macular thickness parameter (AUC=0.76). When using OCT as the discriminatory criterion, we found that the RNFL parameter nasal thickness had a significantly larger AUC than the macular thickness parameter (AUC=0.68). The macular thickness parameter nasal thickness had the largest AUC (AUC=0.76) than the ONH parameter horizontal thickness (vertical integrated) (AUC=0.74).

Conclusion: Selection of parameters, the largest AUC was 0.913 with 10 input parameters (nasal quadrant thickness, superior quadrant thickness, inferior quadrant thickness, vertical integrated rim area, horizontal integrated rim area, superior quadrant thickness, inferior quadrant thickness, vertical integrated rim area, horizontal integrated rim area, superior quadrant thickness).

P150 OCULAR BLOOD FLOW IN PRIMARY OPEN ANGLE GLAUCOMA EXFUSION SYNDROME AND EXFOLIATION GLAUCOMA

H. Durukan, C. Basaran, M. Irkec, M. Orhan
Hacettepe University, Ankara, Turkey.

Introduction: There were increased retinal vascular resistances in the clinic and arterial systolic pressure was shown to be related to the optic disc evaluations.

Methods: All participants were classified into three groups; POAG (n=79), OHT (n=34) and controls (n=74). Patients in POAG and OHT groups were all newly diagnosed and free of ocular medication.

Results: The mean of the visual field standard deviation of patients was significantly lower in POAG and OHT groups compared to controls (p<0.05).

Conclusion: These findings suggest that ocular blood flow velocities in the retrobulbar vessels were altered in POAG, OHT, EG though significant novelty was not known yet.
controversial whether glaucoma is due to decreased ocular blood flow or decreased blood flow in the retina. Variations in the supply to the optic nerve head seems to be important in the development and progression of several forms of glaucoma.3,4

References:
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sions. Ophthalmology. 1992;99:2030-211. 2. Saittis M, Ourg J, Doudou B, Flammar J. Rate of pro-


P154 DECREASED BLOOD FLOW AT NEURORETINAL OPTIC NERVE HEAD COR-

RELATIONSHIP WITH VISUAL FIELD DEFEIT IN EYES WITH NORMAL TENSION GLAUCOMA I Kimura
Kai University School of Medicine, Tokyo, Japan

Purpose: To determine the relationship between the blood flow parameters of the blood ves-

sels at the rim of the optic disc and the glaucomatous visual field changes.

Design: Observational cross-sectional study.

Participants: Fifty nine patients with normal tension glaucoma (NTG) participated in the study. The participants selected whose visual field defects were confined to either the superior or infe-

rior hemifield.

Methods: Tissue blood flow in the neuroretinal rim of the optic disc was determined with the help of lacunae staining in enucleated eyes with glaucomatous optic nerve. Intraocular pressure, central retinal artery perfusion pressure, retinal nerve fiber layer thickness were measured in a t 0.25 degree area of the superior and inferior margins of the optic disc.

Main outcome measure: The mean blood flow (MBF, arbitrary units) was calculated by the automatic full-field perfusion image analyzer program, and the ratio of the MBF in the supe-

rior to the inferior neuroretinal area (the MBF ratio) was calculated.

Results: The angle width in the MBF (in the eye with advanced inferior visual field de-

fect, 1.45 ± 0.31 µm) was significantly higher than that in the eyes with advanced inferior visual field defect (0.7, 18, P <0.001, Mann-Whitney U-test). The blood flow in the neuroretinal rim of the optic disc was found to correspond to the retinal visual field defects in eyes with NTG.

References:


Ultrasound

P155 EVALUATION OF THE ANTERIOR CHAMBER ANGLE IN ASIAN INDIAN EYES BY ULTRASOUND BIOMICROSCOPY AND GONIOSCOPY

S. Kausilit, R. Jain, S.B. Pandav, A. Gupta
Postgraduate Institute, Chandigarh, India

Purpose: To compare the ultrasound Biomicroscopic measurement of the anterior chamber angle in Asian Indian eyes with the angle width estimated by gonioscopy.

Design: Observational cross-sectional study.

Participants: One hundred and sixty three eyes of 163 patients were assessed by gonioscopy and ultrasound Biomicroscopy (UBM) 1,2.

Methods: Temporal quadrants of the angles were categorized by gonioscopy as Grade 0 to Grade 4 using Shaffer’s classification. The angles assessed were measured by UBM using the UBM Model 840, Paradigm Medical Industries Inc 1,2.

Main outcome measure: The angle width estimated by gonioscopy correlated significantly with the angle width measured by UBM. Ultrasound Biomicroscopy (UBM), though subjective 5, is a reliable method for esti-

ating anterior chamber angle.

References:


P158 ULTRASOUND BIOMICROSCOPIC STUDY OF IRIDOCELULAR ZONE IN SECONDARY GLAUCOMAS WITH ORGANIC BLOCK OF THE ANTERIOR CHAMBER ANGLE V. Brines
IRTC Eye Microsurgery, Ekaterinburg, Russian Federation

Objective: Ultrasound Biomicroscopy (UBM) 1,2 is a useful diagnostic tool in various forms of glaucomas. Nevertheless, there are no extensive UBM studies of patients with secondary glau-

comas. It could be valuable to study the choice of tactics. Also it could be interesting to investigate the topog-

ographic status of uridociliary zone in secondary glaucomas with organic block of the anterior chamber angle by UBM.

Design: A non-randomized instrument and clinical study.

Patients: Sixty six patients (66 eyes) with neovascular (20 eyes), inflammatory (9 eyes), postop-

eration (10 eyes) and traumatic (15 eyes) glaucomas. A glaucoma control group was formed by 60 persons (60 eyes) with healthy eyes matching by age and sex.

Methods: Standard UBM (Humphrey Ultrasound Biomicroscope Model 840, 62 MHz) was per-

formed.

Main outcome measure: Angle status, configuration of the posterior chamber acoustic cross-

section and posterior chamber depth were estimated.

Results: Various degrees of 'pull' mechanism were found in 54 eyes (85.7%); in 9 eyes (14.3%) the angle was filled with fibrovascular tissue and had rounded shape. Nor-

mally, the posterior chamber angle acoustic cross-sectional area was in 51 cases (80.3%) 'opened' in ninia (14.3%) (that is, absence of papillary edge contact with the lens surface) and complete iridociliary adhesion in three cases (4.8%). Shallow anterior chamber (not more than 2.5 mm) was found in 23 (35.3%) eyes. The mean anterior chamber depth was 11.84 ± 0.56 mm (range 11.2 to 11.9 mm). The mean anterior chamber depth was 9.41 ± 0.8 mm in 60 (36%) and 35 (55%) eyes; deep (not less than 0.8 mm) in 1 (1.7%) and 6 (10%), respectively. All the results did not depend on the etiology of secondary glauco-

mata (chi-square test).

Conclusion: Most widespread forms of secondary glaucomas are characterized by similar
A water-drinking provocative test: comparison between progressive open angle glaucoma patients and relation to diurnal tension curve

Purpose: To compare the intraocular pressure (IOP) rise obtained with a water drinking test (WDT) performed with a half liter and a one liter water ingestion in stable and progressive primary open angle glaucoma (POAG) eyes and how it relates to the IOP fluctuation obtained during a diurnal tension curve (DTC).

Method: A pilot study was performed in a standard manner with one liter of water ingestion, at 11:00 hours in a different setting, in a simple, convenient and easier way if compared with the time consuming DTC. With this aim a non-invasive and reliable method was obtained for the documentation of large IOP fluctuations and in the evaluation of success of surgical treatments, in a way that can be used in daily practice.

Results: All measurements were made in the four quadrants by the same examiner. The measured average angle is 4.66 degrees before and 8.83 degrees after the iridotomy, showing a significant increase in angle dimensions (p=0.006).

Conclusion: Angle dimensions can be significantly influenced by NaCl YAG laser in situ keratomileusis and in the assessment of cases, offering potential protection against acute angle closure.

References:

P160 THE WATER-DRINKING PROVOCATIVE TEST: COMPARISON BETWEEN PROGRESSIVE OPEN ANGLE GLAUCOMA PATIENTS AND RELATION TO DIURNAL TENSION CURVE

J.M. Rodriguez
Hospiten, Universidad de La Samanita, Bogota, Colombia

Purpose: The aim of this study is to quantify anterior segment morphology changes by use of Ultrasound biomicroscopy (USM) in eyes with POAG before and after NaCl YAG laser in situ keratomileusis in primary angle closure glaucoma (PACG) in European patients.

Patients and methods: Ten eyes of ten patients presenting a PACG in 2004 and at 2005 at our clinic were included in this study. All patients underwent 24 hour UBM examination and a NaCl YAG laser peripheral iridotomy. Average age of patients was 65 years old. Five patients were females. Baseline measurements were performed before and 1 month after the iridotomy. One eye was excluded from the study. Measurements of the angle were made before and after NaCl YAG laser iridotomy.

Results: Measurements were performed in the four quadrants by the same examiner. The measured average angle is 4.66 degrees before and 8.83 degrees after the iridotomy, showing a significant increase in angle dimensions (p=0.006).

Conclusion: Angle dimensions can be significantly influenced by NaCl YAG laser in situ keratomileusis in progressive eyes, offering potential protection against acute angle closure. Water drinking test is a new and reliable exam to obtain these results, is a non-invasive and not-invasive tool for documental measurement and evaluation preparation and post laser iridotomy.

References:

P165 MORPHOLOGY OF CORNEAL NERVES USING CONFOCAL MICROSCOPY (CONFOKAL) SUBSURFACE ULTRASOUND MICROSCOPIC IMAGING OF THE INTACT EYE

Kobe University School of Medicine, Kobe, Japan

Introduction: Confocal microscopy is a non-invasive optical technique for the documentation of the microscopic corneal findings in patients affected with open angle glaucoma (POAG) and successfully treated POAG patients, in order to correlate the microscopic analysis of corneal nerves with previous clinical and functional studies.

Methods: We considered 40 consecutive exams executed with the CS3, presenting four complete sets of imaging of corneal nerves. The density of the neural network was measured, and the thickness of the corneal nerves, were measured the radial fixation. Factor III had factor loadings of -0.892 for astigmatism and 0.833. The log-scaled BCVA had 0.858 for existence of Haab’s striae, 0.851 for operative age (months), and 0.831 for horizontal corneal diameter, whereas 0.028 for spherical equivalent and 0.094 for eccentricity of fixation. Partial correlation coefficient was also obtained between the log-scaled BCVA and the examination of choroidal ocular perfusion in OBFA was 25.5%. After therapy with COSOPT eye drops, the reduction of the IOP was 28.0% and the improvement of visual acuity was 12.5%.

Results: In the 30 eyes of 30 patients treated with timolol eye drops, the examination of the optic nerve head showed a statistically significant result for the choroidal thickness in the POAG group (p=0.005).

Conclusion: The exams performed by the CS3 allows to reveal an anomalous morphology of the stromal nervous fibres in glaucomatosus subjects subjected by the traditional micrometric analysis of the cornea, providing a new method in the study of the microscopic corneal structure of POAG patients.

References:

P169 PERSPECTIVE OF TREATED HYPERTENSIVE EYES TO PRIMARY OPEN ANGLE GLAUCOMA IN OUR PRACTICE, AFTER LONG TERM OBSERVATION

E.A. Skoulou, D. Koriakian, S. Georgaras
Ophthalmos Institute, Athens, Greece

Introduction: Ocular hypertension (OHT) is the precursor of the primary open angle glaucoma (POAG). The dilemma is “which is the best time and the ideal medical therapy for remaining”.

Purpose: a) Our goal is to assess and to evaluate the efficacy of the medical treatment in OHT b) To describe and analyse base line demographic and clinical factors that predict the conversion of OHT to POAG c) The possibility to have under control the risk factors, to prevent and to delay the conversion of OHT to POAG.

Design i) participants: We conducted a prospective observational comparative study of 300 patients recruited from 40-65 years old, a) POAG (POAG) b) Treated hypertension (HT) c) Low-risk, d) Low-risk, II) Low-risk, III) undisciplined.

Methods: i) outcome measures: The period of observation was 1-6 years (October 98- October 04), 105 male (42%), 145 female patients (58%). We determined eligibility from a comprehensive eye examination, medical ocular and familiar history, myopia >30 cpd/disk ratio, VF (visual field) testing, central corneal thickness measurement (CCT), ocular blood flow analysis (OBFA), scanning laser ophthalmoscopy (SLO-HRT). Medicines used were entered into a database. The results were analyzed using paired t-test.

Results: Statistically significant differences between three groups (p<0,001). I) In LRG: 155 patients (65%OF), one case converted in POAG (0,65%); II) In HG: 95 patients (30%OF), no case converted (0%); III) In PR: 54 cases (18%OF), four (4%) cases converted in POAG. The presenting BCVA (mean±SD) before the intervention was: (0.8±0.1) (0.7±0.1) (0.6±0.1) respectively, for 0.8±0.1 (0.7±0.1) (0.6±0.1) respectively. We found that all parameters had statistically significant correlations with the possibility to convert OHT into POAG (p<0.005). CCT <550μm is the big factor risk, the “Index conversion” OHT in POAG. 

In combination with photangiodynia (XALATAN OR TRIVAPTAN), we had the intervention of the IPD -2.6%. In the combination therapy with COSOPT, the IPD was 28.0% and the improvement of choroidal ocular perfusion in OBFA was 25.5%. In combination therapy: COSOPT,


Purpose: To determine the racial variability of glaucoma risk factors between African-Caribbean and Caucasians in a Canadian urban population.

Methods: Three hundred and ninety-eight patients recruited from a high-risk glaucoma clinic. Subjects were included if they fulfilled one or more of the following criteria: a) Caribbean or African descent and/or, b) Above 50 years of age and/or c) Positive family history for Open Angle Glaucoma. Patients underwent complete ocular examination including visual acuity, corneal pachymetry (C), intraocular pressure (IOP) measurement, gonioscopy, slit lamp and dilated fundus examination, as well as imaging of the optic nerve with confocal scanning laser ophthalmoscopy (HRT II).

Results: These included that in a Canadian urban setting, African-Caribbean race was associated with an increased number of risk factors for the development of open-angle glaucoma, including higher IOP, thinner C, and larger cup-disc ratio.


Results: Forty-one eyes from 36 CSLO Ancillary Study participants developed POAG. Seventy-three percent (95% CI 56-89) of subjects were included if they fulfilled one or more of the following criteria: a) Caribbean or African descent and/or, b) Above 50 years of age and/or c) Positive family history for Open Angle Glaucoma. Patients underwent complete ocular examination including visual acuity, corneal pachymetry (C), intraocular pressure (IOP) measurement, gonioscopy, slit lamp and dilated fundus examination, as well as imaging of the optic nerve with confocal scanning laser ophthalmoscopy (HRT II).

Results: Three hundred and ninety-eight patients recruited from a high-risk glaucoma clinic. Subjects were included if they fulfilled one or more of the following criteria: a) Caribbean or African descent and/or, b) Above 50 years of age and/or c) Positive family history for Open Angle Glaucoma. Patients underwent complete ocular examination including visual acuity, corneal pachymetry (C), intraocular pressure (IOP) measurement, gonioscopy, slit lamp and dilated fundus examination, as well as imaging of the optic nerve with confocal scanning laser ophthalmoscopy (HRT II).

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Results: These included that in a Canadian urban setting, African-Caribbean race was associated with an increased number of risk factors for the development of open-angle glaucoma, including higher IOP, thinner C, and larger cup-disc ratio.

between 1991 and 2003 for more than one year after the first hemorrhage. Non-recurrent group was defined as a first episode of disc hemorrhage in recurrent group or more episodes of hemorrhages. Mean follow-up period of non-recurrent group was 54.7 months while of recurrent group was 67.5 months.

Results: Twenty-six eyes (46.6%) showed recurrent and thirty-one eyes (54.4%) showed non-recurrent hemorrhages. Normal tension glaucoma was the most common type of choroidal hemorrhage in both groups and the most common location of disc hemorrhage in both groups. There were no differences in prevalence of associated systemic diseases between both groups. The cumulative probability of progression of optic disc changes was significantly greater in patients with recurrent than non-recurrent disc hemorrhage (p<0.005, log rank test). However, no significant difference was found in the rate of progressive visual field defects in eyes with recurrent and non-recurrent disc hemorrhages compared with eyes with non-recurrent disc hemorrhage.

Conclusion: Recurrent group showed greater probability of progressive change of optic disc than non-recurrent group although visual field change was not different between two groups. Further study must be made with a larger number of patients and longer follow-up period.

References:

P117 THE OPTIC CHASM THICKNESS OF GLAUCOMA AND OCULAR HYPERTENSION PATIENTS
E.F. Basar, A.B. Toprak, S. Orgu, I. Kurutay, C. Guler
Celal Bayar University Hospital, Manisa, Turkey

Introduction: Glaucoma affects the anterior visual pathway, and these morphologic changes in the anterior visual pathway are correlated with glaucomatous neuropathy development.

Aim of the study: To investigate the relation between optic disc topographic values and optic chiasm height in patients with glaucoma and ocular hypertensive (OH).

Methods: Twenty-two patients with glaucoma and 22 patients with ocular hypertension were obtained from Ophthalmology Department (n=44). The patients were scanned with an open MRI (3 Tesla MRI) system. Magnetic resonance imaging examinations were performed with an open MRI system (Gyroscan, 0.23T, Philips Medical Systems, The Netherlands) using axial and parasagittal (GRE T1 and T2) sequences. The thickness of the optic chiasm was measured on both sides using electronic calipers.

Results: There was a significant difference in terms of age among groups (p=0.54). There was a significant difference in terms of chiasmal height (CH) between glaucoma and OH patients (p=0.003). Mean CH of the glaucoma patients was 1.68±0.577 mm (mean±SD) and the CH of the OH patients was 1.82±0.498 mm (mean±SD). There was a significant difference in terms of mean deviation between study groups (p=0.002). The measured optic disc parameters were: disc area, cup area, cup volume, rim volume, cup/disc ratio, linear cup/disc ratio, mean cup depth, mean nerve fiber layer (RNFL) thickness, and mean RNFL thickness. There was no correlation between any of the HRT parameters and CH for glaucoma and OH patients (p>0.05, and p=0.05 respectively).

Conclusion: We found that glaucoma patients were significantly different from those in OH patients. These results are consistent with those of previous reports which have shown a difference between glaucoma patients and controls.

Chiasma height may be a predictor of glaucomatous optic atrophy. There is no relation between HRT parameters and chiasmal height, further studies with more patients may resolve the presence of such a relation.

References:

P118 THE ASSOCIATION OF PRIMARY OPEN-ANGLE GLAUCOMA AND MIGRAINE HEADACHE
T. Tarhan1, J.F. Salom1
1Oxford Eye Hospital, Oxford, United Kingdom, 2Oxford Radcliffe Hospitals, Oxford, United Kingdom

Introduction: In some work link open-angle glaucoma and migraine. A few studies suggest the possibility of an association between history of typical migraine headache and glaucoma, which could be modified by age, while other studies find no association between migraine and glaucoma.

Aim: To investigate the relationship of a history of migraine headache to open angle glaucoma.

Methods: A case control analysis was performed from the database of Oxford Eye Hospital. The data for all the new patients referred to the clinic in the last 10 years was collected. The diagnosis of glaucoma was based on a typical optic disc appearance and corresponding visual field abnormally irrespective of intraocular pressure. 224 patients with a history of typical migraine headache (MIG) and 224 patients without the history of migraine headache (controls, 224 patients, group-2).

Results: Mean age in group-1 was 59.78 ± 10.5 (SD; T10.2), Range: 29-86) was 65.65 ± 10 SD; T10.2, Range: 29-86) in the group-2. 13.39% (30 patients) of glaucoma patients with history of migraine were diagnosed to have normal tension glaucoma.

Conclusion: These data suggest an association between history of typical migraine headache and open angle glaucoma.

References:

P119 MIGRAINE AND VASCULAR DYSREGULATION IN THE PATHOGENESIS OF THE GLAUCOMAS
G Gramer, E Gramer
University Würzburg, Würzburg, Germany

Purpose: To evaluate the frequency of migraine (MI) and family history (FH) of MI in patients with glaucoma (GL) or ocular hypertension (OH). 2. whether there is any difference in the frequency of MI in different types of GL compared to Normal Tension GL (NTG). 3. the frequency of MI in relation to the stage of visual field loss (VFL) in patients with Primary Open Angle GL (POAG) and NTG. 4. the frequency of MI in glaucoma patients with a vasospastic syndrome (VS).

Design: Retrospective case controlled study with prospective questionnaire study.

Participants: Of 2007 patients who provided a yes or no answer on MI diagnosis, 1244 had POAG, 140 NTG, 49 pigmented LG (PG), 64 PEX, 138 OH and 218 PACG. 174 patients had other types of GL, which are not evaluated here due to small sample sizes. A total of 1952 patients provided a yes or no answer on the diagnosis of MI. 1952 patients (97%) were included in this study.

Methods: By means of a questionnaire addressed to patients and their ophthalmologists, GL patients were interviewed using open ended questions, concerning e.g. FH of MI (FHs), type of GL, stage of VFL, age at the time of diagnosis and potential risk factors, such as heart disease, vasospasm and migraine. Patients interviewed their relatives whether GL or OH was false or corrected. Fisher’s exact test two-sided. Logistic Regression was used for analysis. The Mantel Haenszel chi-square test were used for statistics. Regarding the stage of VFL, we divided our patients into two groups, with or no or minimal VFL (stages 0-1; classification of Ausborn) or moderate to severe VFL (stages III-V).

Main outcome measures: Differences in the frequency of MI in the glaucoma compared to the patients with and without MI and FH of MI.

Results: Of 2007 patients, 13.7% (277 have a MI. A FH of MI was reported by 38.6%, a FH of MI by 19.5%, and a FH of MI by 6.9%. Patients with FHs MI (13.1%, NTG 21.4%, POAG 13.1%, PG 13.1% and PACG 13.1%). The frequency of MI and FH of MI was not significantly different between the groups of MI and FH of MI vs. NTG (13.1% vs. 21.4%, p = 0.0098), and between PEX and NTG (7.81% vs. 21.4%, p = 0.166). There were no significant differences between POAG, MI and NTG (13.1% vs. 21.4%, p = 0.0058). There were no significant differences between PEX and NTG (13.1% vs. 21.4%, p = 0.0058). 0.76% NTG patients with VFL stages 0-4, 21.4% and 58 patients with stages III-V, 20.7% have MI. Of 964 POAG patients with stages 0-II, 13.1% and 259
patients with stages III–V, 12.7% had MI. There is significant difference in the frequency of POAG compared to NTG patients (p < 0.001). No severe angle-closure was seen in POAG (P = 0.607) and NTG (P = 0.6025). 4. MI was more frequent in patients with VS (31%, 84% of 270) compared to those without VS (16.8%, 282 of 1682; p < 0.001).

Conclusions: The frequency of GL and MI decreases with age. Inspite of no sign-ificant age difference between POAG and NTG patients, MI is significantly more frequent in NTG compared to POAG. This suggests an associated inflammatory and autoimmune pathology with polygenetic, vascular aetiology of these two diseases with familial predisposition. Regardless of the extent of VFL in GL, MI is not a prognostic factor.

Methods: 1. Gfullaurete, T. Itagaki, K. Kishida, K. Futu

Objective: To identify the clinical results of three types of microsurgery in the management of primary angle-closure glaucoma.

Design: Retrospective analysis of case notes of patients presenting with acute angle closure during a three-year period.

Participants: Case notes of 16 patients presenting with acute angle closure between January 2001 and May 2004 were reviewed at this study. Sixteen eyes of 16 patients (10 male and 6 female) were diagnosed with primary acute angle closure glaucoma and was included for this study.

Main outcome measures: Patients' profile, visual acuity, duration of symptoms, treatments were analysed to compare with the published protocol.

Results: The mean age of 16 patients was 67.5 years (range 35-93). 9 patients (56.2%) were male; Group 2 (n=50) patients with narrow angles without acute primary angle closure (median age:70.5 years and 31 were females). Type-D personality was present in 71.74% of group 1; 28% of group 2 and 41.56% of group 3 (p<0.0001). The difference between group 1 and 2 was statistically significant. In group 1 and 3 the prevalence between acute closure as dependent variable and Type-D personality as independent vari-able was studied using multiple logistic regression adjusting for gender and age. Adjusted OR was 1.97 (CI 95%: 2.28-14.27) for probability of acute closure in patients with Type-D personality.

Conclusion: Type-D personality is significantly related to acute angle closure in dependent of age and gender. The results of this study indicate that Type-D personality in an individual with occurablbe angles may be worth investigating as another risk factor for acute posterior angle closure glaucoma.


P178 PROSPECTIVELY COMPARISON STUDY ON MANAGEMENT OF PRIMARY ANGLE-CLOSURE GLAUCOMA BY TWO TYPES OF MICROSCOPY: TRABECULOPLASTY, PHACOTRABECULOPLASTY WITH INTRAOCULAR LENS IMPLANTATION.

Shuangliang Hua, Ji, X. Yang, Jia, X. Yu, Cai

Zhongshan Ophthalmic Center, Guangzhou, China

Objective: To investigate the clinical results of two types of microsurgery in the management of primary angle-closure glaucoma.

Methods: Three types of microsurgery were set up for a prospective study on 50 eyes (45 cases) with primary acute or chronic angle-closure glaucoma which were performed trabeculoplasty only (Trab group) or Phaco+trabeculoplasty+ intraocular lens implantation (Phco+IOL group). The criteria of these operations were: 1. Age > 50 yrs, 2. IOP ≥ 22 mmHg amblyauscularly 24 hours postoperatively, 3. Angle closure was not seen reopened in preoperatively each case.

Results: After a mean postoperative follow-up of 8.5 ± 4.0 months, the better-corrected visual acuity was improved in Phco+IOL group (77.3%) while Trab group was 39.3% (P<0.02). The postoperative intraocular pressure (IOP) were well controlled in both groups compared with preoperative IOP (Both P value<0.001). The anterior chamber depth was seen deeper in Phco+IOL group (P<0.01). The intraocular lens implantation can be effectively managed primary angle-closure glaucoma.

P179 TYPE-D PERSONALITY: A NEW RISK FACTOR FOR ACUTE PRIMARY ANGLE CLOSURE?

N. K. Wang, M. K. Houyoux, N. Taubenslag, DE Grigera1

1Hospital de Clínicas José de San Martín, Buenos Aires, Argentina, 2Academia Nacional de Medicina, Buenos Aires, Argentina

Objective: To investigate the association between 'Type-D' personality and acute primary angle closure in patients with occludable narrow angles, since psychotropic episodes have been previously related to acute primary angle closure 1.

Design: Cross-sectional study.

Participants: Ninety-six patients with narrow angles (46 of which having suffered acute pri-mary angle closure) and 46 controls with open primary angle glaucoma attending a Buenos Aires glaucoma clinic from April 2003 to September 2004 were psychologically examined at the time of an initial medical follow-up.

Methods: 'Type-D' personality or 'distressed' personality, describes people who experience internal negative emotions about themselves, their role and their social environment in interactions in social interac-tions 2. All patients underwent a brief psychiatric interview and completed the DS-14 scale for type D personality 3.

Main outcome measures: The relationship between 'Type-D' personality and acute primary angle closure was investigated using Chi square test.

Results: The analysis was performed in three groups (Group 1 (n=46) patients with narrow angles who had suffered acute primary angle closure (median age: 72 years and 40 were fe-male); Group 2 (n=50) patients with narrow angles without acute primary angle closure (me-dian age:73 years and 38 were females); Group 3 (n=50) controls with primary open angle glaucoma (median age: median age:70.5 years and 31 were females). Type-D personality was present in 71.74% of group 1; 28% of group 2 and 41.56% of group 3 (p<0.0001). The difference between group 1 and 2 was statistically significant. In group 1 and 3 the prevalence was studied using multiple logistic regression adjusting for gender and age. Adjusted OR was 1.97 (CI 95%: 2.28-14.27) for probability of acute closure in patients with Type-D personality.

Conclusion: Type-D personality is significantly related to acute primary angle closure in dependent of age and gender. The results of this study indicate that Type-D personality in an individual with occurablbe angles may be worth investigating as another risk factor for acute posterior angle closure glaucoma.


P180 MANAGEMENT OF ACUTE ANGLE CLOSURE GLAUCOMA AT AN UK DISTRICT GENERAL HOSPITAL.

G. D. Day, D. G. Ghosh1

1North Tyneside Hospital, North Shields, United Kingdom, 2Essex County Hospital, Lexden, Colchester, United Kingdom

Objective: To analyse the management of acute angle closure glaucoma (AACG) at Essex County Hospital and compare it with published protocol

Design: Retrospective analysis of case notes of patients presenting with acute angle closure glaucoma at Essex County Hospital over a three year period.

Participants: Case notes of 16 patients presenting with acute angle closure glaucoma between January 2001 and May 2004 were reviewed at this study. Sixteen eyes of 16 patients (10 females and 6 males) were diagnosed with primary acute angle closure glaucoma and was included for this study.

Main outcome measures: Patients' profile, visual acuity, duration of symptoms, treatments were analysed to compare with the published protocol.

Results: The mean age of 16 patients was 67.5 years (range 35-93). 9 patients (56.2%) had right eye affected and the rest had Acute Glaucoma in their left eye. One patient was from South Eastern Asian and the rest were

www.globalaigs.org 153/156
P181 ACUTE EIGHTEEN IS ASSOCIATED WITH LESS FLEXIBILITY – A HISTOLOGICAL STUDY OF THE IRIS IN THE DEVELOPMENT OF ANGLE CLOSURE IN CHINESE

J. Xu, M. He, Y. Yu, Y. Zheng, X. Liu
Zhongshan Ophthalmic Center, Guangzhou, China

Introduction: It has been commonly accepted that narrowing of the drainage angle is the anatomical basis of primary angle closure (PAC). However, PAC acute episode only develops in small proportion of the patients with this anatomical characteristic. Histological studies in liver scirrhus suggest that the collagen type II is associated with the decreasing flexibility of the tissue.

Aims of study: To investigate the histological changes of the iris in the mechanism of angle closure.

Methods: Iris specimens were obtained by surgical iridectomy in a consecutive serial of patients diagnosed as acute angle closure, for systematic staining by Sirius Red and polarization microscopy.

Results: Compared to the eyes with early chronic PAC, POAG and normal controls, the total amount of collagen increased by 12%, and the total amount of collagen and proportion of type III collagen in the iris stroma increased by 65%, while the collagen type II decreased by 56%.

Conclusion: The anterior chamber angle closure may be understood as a result of changes in collagen types and collagen remodeling.


P182 A COMPARISON OF THE EFFECTS OF INTRAVITREAL TRIAMCINOLONE ACETONIDE (IVA) 4MG INJECTION VERSUS 8MG.

H.K. Kim
Kim’s Eye Hospital, Konyang University, Seoul, South-Korea

Introduction: To evaluate IOP change due to triamcinolone concentration.

Aim of the study: To compare intraocular pressure after prior therapeutic IVA 4mg and 8mg.

Object and method: This study was a retrospective, single center, randomized comparison of 100 patients who received IVA 4mg between March 2002 and 2004. Patients were grouped as PXE syndrome. Patients with prior intraocular surgery, dry eye syndrome, and systemic disease were excluded. Inclusion criteria were defined as established diagnosis of high-tension open-angle glaucoma in at least one eye, satisfactory corneal transparency and no previous vitreous surgery.

Results: Pre-injection average IOP in A group was 12±0.45 mmHg, 1 week after injection was 15±0.51 mmHg. B group was 13±0.23 mmHg, 1 week after injection was 20±0.34 mmHg, and 1 month after injection was 18±0.56 mmHg. There was no difference in pre-injection baseline IOP and post-injection in both of group A and B group (p-value=0.05). 90% of patients (90%) experienced an increase pressure elevation to 24 mmHg or higher at a mean of 18 days. Pressure elevation was controlled with conservative treatment in all patients.

Conclusion: There is no statistical significance in pressure elevation after injection of triamcinolone 4mg and 8mg. And there is no untreated complication. Further studies are necessary to measure accurate concentration of triamcinolone and to prevent of complication after high dose triamcinolone injection over 8mg.


P185 P186 CENTRAL CORNEAL THICKNESS IN PATIENTS WITH PSEUDOEXFOLIATION SYNDROME

S. Ujuru, I. Cakir, G. Yildirim, N. Sell Yurdabak, A. Meden
Izmir Ataturk Egitim Arastirma Hospital, Izmir, Turkey

Purpose: To evaluate central corneal thickness (CCT) in patients with pseudoexfoliation (PXE) material.

Methods: Consecutive patients attending outpatient clinic and Glaucoma Unit between March 2004-May 2005 with PXE material were included in the study. All patients were carefully examined to verify the presence of PXE material after pupil dilation. Patients with typical PXE neck head change sign were included. Two characteristics for glaucoma optic nerve head morphology were classified as PXE glaucoma: those without glaucoma optic nerve head changes were grouped as PXE syndrome. Patients with prior intracocular surgery, dry eye syndrome, and corneal ectatic corneal decompensation were excluded from this study. CCT measurement was performed with Opikon 2000 Pacline pachymeter by a single operator using averaging mode. Three consecutive measurements were used to calculate the average CCT. The results were compared to age and sex-matched control group.

Results: Average age of patients with PXE glaucoma (n=18), PXE syndrome (n=14) and the control group (n=40) were 68.7±1.7, 71.1±2.7, and 71.1±2.6 years, respectively. Average mean defect, steep fluctuation and corrected pattern standard deviation were −15−3±1.2, 4±1±1 and 5±1±1.0 in patients with PXE glaucoma, respectively. CCT was significantly lower in the PXE glaucoma patients (551.5±33.3 microns; p=0.039) and the controls (551.5±33.3 microns; p=0.046). There was no statistically significant difference between the PXE syndrome and controls.

Conclusion: Patients diagnosed with PXE glaucoma have significantly lower CCT measurements than patients with PXE syndrome and normal individuals. These findings suggest that pseudoexfoliation material may contribute to the development of glaucoma, its progression and visual field damage, and that CCT measurements should be taken into account when assessing risk for the development of glaucoma among subjects with PXE.

ARGININE IN EXFOLIATION SYNDROME AND GLAUCOMA


P187 PLASMA LEVELS OF L-ARGININE, ASYMMETRIC AND SYMMETRIC DIMETHYL-ARGININE IN EXFOLIATION SYNDROME AND GLAUCOMA

E. Hatef Naimi, F. Rahimi, S.F. Mohammadi, M.N. Hashemian, H. Rahbari

Central Hospital, Joensuu, Finland

Purpose

To determine whether a higher prevalence of glaucoma would exist in cardiovascular patients.

Methods

We aimed to study, if asymmetry and symmetry of dimethyl-arginine (SDMA and SDMA and L-arginine had no significant statistical correlation (Mann-Whitney U, Wilcoxon W) between XFS, XFG and control patients. The plasma levels of ADMA, SDMA and L-arginine levels in XFS group compared to controls. We used also the same patient groups for plasma analyses of ADMA, SDMA and L-arginine. Interestingly, there was a significantly positive correlation between plasma levels of ADMA in both the patient groups (P=0.000) and in the XFG subgroup (P=0.002), but not in the XFS subgroup (P=0.188).

Conclusions


P189 CIRCULATING PLATELET AGGREGATES IN PSEUDEXFOLIATION GLAUCOMA


Methods

We aimed to study, if asymmetry and symmetry of dimethyl-arginine (SDMA and L-arginine had no significant statistical correlation (Mann-Whitney U, Wilcoxon W) between XFS, XFG and control patients. The plasma levels of ADMA in both the patient groups (P=0.000) and in the XFG subgroup (P=0.002), but not in the XFS subgroup (P=0.188).

Conclusions


P191 ANGELIC RECEPTION A PERMANENT SEQUEL OF CHARHANSEFOO FIREWORKS INJURIES

E. Hafet Naimi, F. Rahimi, S.F. Mohammadi, M.N. Hashemian, H. Rahbari

Eye Research Center, Farabi Eye Hospital, Tehran, Iran

Purpose

To evaluate the frequency and extent of angle recession in hypophemia following blunt fireworks eye injuries.

Design

Case series.

Participants

Twenty-six patients with unilateral hypophemia due to traumatic fireworks (Charhsaneseo-Soor), 4 weeks following injury.

Methods

Two examiners independently performed gonioscopy on both the participants. Main outcome measures

The mean IOP before the injection was 11.2 ± 3.07mmHg (7-17mmHg), while it was 13.8 ± 3.98mmHg (10-21mmHg) after 13.5±4mmHg after 3 months period after the injection. In eight eyes (33.3%), an increase of minimum 5mmHg in IOP was detected at the first month. The differences between the IOP measurements at the baseline and before and first and third months were not significant (Mann-Whitney U test). No significant statistical difference was detected in IOP after the injection (P=0.000). In two eyes topical anti-glaucomatous agents were used while in three eyes trabe- culectomies with mitomycin-C were performed to control the IOP.

Conclusions

The posterior sub-Tenon's injection of corticosteroids cause transient or chronic increase in IOP in the cases with chronic uveitis.

References

10. DIFFERENTIAL DIAGNOSIS

P193 OPTIC DISC APPEARANCE AND VISUAL FIELD LOSS AT TIME OF DIAGNOSIS IN PATIENTS WITH OPTIC DISC DRUSEN AND TEMPO- DYNAMIC VISUAL FIELD PROGRES- SION COMPARED TO PATIENTS WITH NORMAL TENSION GLAUCOMA

M. Schargus1, G. Gramer 2, E. Gramer 2
1University Eye Hospital Würzburg, Würzburg, Germany, 2Augenklinik Universitats-Augenklinik Würzburg, Würzburg, Germany

Purpose: If optic disc drusen (ODD) are associated with glaucoma it might be helpful to know more about the natural course of optic disc changes and visual field progression (VFP) in patients with ODD. Therefore we investigated: I. the time dynamic of VFP in patients with ODD and normal tension glaucoma (NTG) compared to patients with ODD and normal tension glaucoma (NTG) and the influence of ODD on the risk of progression. II. the time dynamic of ODD and glaucoma progression.

Methods: VFP at time of diagnosis was staged in ODD and NTG patients. According to the eye with the more severe VFP we categorised for both diseases 3 groups: no VFP, VFP stage III, (corticosteroid treatment at least for 1 year). Then ODD patients were categorized into three groups: untreated, untreated, and treated with topical corticosteroids. Statistical analysis was carried out using non-parametric statistics.

Main outcome measures: I. Time difference between the age at time of diagnosis for patients with ODD and normal tension glaucoma (NTG) treated and untreated with ODD.

Design: Retrospective case controlled study

Participants: Seventy seven patients with ODD which met the inclusion criteria: ultrasonographic confirmed ODD, reliable visual field findings, no other disease which can cause a visual field defect. Seventy seven patients with normal tension glaucoma (NTG) were included.

References:

Results: A. The time difference at diagnosis between age of patients with ODD and normal tension glaucoma (NTG) treated and untreated with ODD was two years (34.8 vs 41.6 years). B. Patients with ODD and normal tension glaucoma (NTG) treated with corticosteroids showed a significant time delay of progression of disease compared to untreated ODD patients.

Conclusions: It is important to note that nearly one-fourth of the patients waited less than three minutes when instilling multiple glaucoma medications and waiting more than three minutes was positively associated with increasing education (r=2.37, p=0.019). Conclusion: non-adherence to glaucoma medical therapy is a significant problem with patients and this was consistent across the three practices surveyed.

References:

P196 TFF1, MUC5AC AND HLA-DR EXPRESSION BY CONJUNCTIVAL CELLS IN CHRONI- CAL ANTIGLAUCOMATOUS SURGERY: A LIGHT AND IMMUNOHISTOCHEMICAL STUDY

C. Baudouin 4, C. Creuzot-Garcher 1
1Université Paris XI, 4Department of Ophthalmology, CHU Br Pôle, Paris, France

Purpose: To assess the expression of TFF1, MUC5AC and HLA-DR on conjunctival cells in chronic antiglaucomatous surgery.

Methods: Histological and immunohistological analyses was performed on 46 tissue biopsies of the conjunctival membrane obtained from 37 patients treated with antiglaucomatous surgery: 17 with trabeculectomy and 20 with argon laser trabeculoplasty. Tissue biopsies were stained using the periodic acid-Schiff (PAS) and immunostained with specific antibodies recognizing TFF1, MUC5AC and HLA-DR.

Results: The expression of TFF1 was higher in trabeculectomy patients compared to argon laser trabeculoplasty patients. The expression of MUC5AC was higher in argon laser trabeculoplasty patients compared to trabeculectomy patients. The expression of HLA-DR was not significantly different between the two groups.

Conclusions: The expression of TFF1 and MUC5AC is higher in trabeculectomy patients compared to argon laser trabeculoplasty patients. The expression of HLA-DR is not significantly different between the two groups.

References:

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11. MEDICAL TREATMENT

P194 PATIENT-REPORTED PROBLEMS IN USING GLAUCOMA MEDICATIONS AND AD- HERENCE TO THERAPY

A.L. Robin 1, B. Sleath 2, D. Covert 3, J. Byrd 4
1Johns Hopkins University, Baltimore, MD, United States of America, 2Univeristy of North Carolina, Chapel Hill, NC, United States of America, 3Acion Laboratories. Fort Worth, TX, United States of America, 4University of North Carolina, Chapel Hill, NC, United States of America

Introduction and aim of study: We investigated self-reported adherence by assessing patient reported problems in using intracocular pressure lowering medications for glaucoma.

Methods: Patients were interviewed in three different practices. A self-administered survey regarding problems or concerns with their glaucoma medications was administered.

Results: Patient-reported problems were common. Problems included: difficulty in opening the bottle (41%), difficulty in remembering to take the medication (Pearson chi-square=10.83, p<0.004), getting the依托 (Pearson chi-square=9.81, p<0.003), squeezing the bottle (Pearson chi-square=6.91, p<0.03), getting the seal off (Pearson chi-square=13.92, p<0.001), and opening the container (Pearson chi-square=15.38, p<0.000). Seventeen percent of patients reported not taking all prescribed doses of their glaucoma medications during the past month. Of the patient demographics were significantly related to non-adherence. Some factors significantly associated with patient non-adherence: having difficulty squeezing the bottle (Fishler’s exact test, p<0.000) and having trouble remembering to take the medications (Fishler’s exact test, p<0.000).

Conclusions: It is important to note that nearly one-fourth of the patients waited less than three minutes when instilling multiple glaucoma medications and waiting more than three minutes was positively associated with increasing education (r=2.37, p=0.019). Conclusions: non-adherence to glaucoma medical therapy is a significant problem with patients and this was consistent across the three practices surveyed.

References:

P195 THE ROLE OF DEPRESSION AND PERSONALITY CHARACTERISTICS IN THE COM- PLEXITY OF GLAUCOMA PATIENTS’ COMPLIANCE

Ch. Pappa, Ch. Pappa, S. Tzaphantis, M. Aspiotis, S. Mafairotti, G. Kittos, V. Mavreas, K. Pallis
University of Ioannina, Greece

Introduction: Non-compliance has proven to be an important factor in the effective management of glaucoma. Treatment may involve the use of multiple lifelong medications and despite therapy, visual progressive impairment in can in many cases not be avoided. Although a number of studies have been performed to investigate the rate and common factors that interfere with non-compliance, none of them addresses systematically the relationship between psychopa- thology, personality characteristics, and non-compliance in glaucoma patients.

Purpose: To assess the impact of the psychological and personality characteristics in the compliance of patients with primary open-angle glaucoma.

Methods: A prospective cross-sectional study was conducted with 100 patients with open angle glaucoma. The study population was recruited from the university glaucoma clinical practice. All patients were ascertained by means of a predetermined questionnaire concerning compli- ance and psychopathological characteristics. The study group of glaucoma patients were also administered: The General Health Questionnaire (GHQ-28), the Symptom Check- list 90-R (SCL-90-R), the Center for Epidemiological Studies Depression (CES-D), the Hostility and Direction of Hostility Questionnaire (HDHQ), the Defence Style Questionnaire (DSQ) and the Brief WHO Quality of Life Questionnaire. Statistical analysis was carried out using Kruskal-Wallis’ test, correlation tests and Multiple Logistic Regression Analysis with compliance to treatment as dependent variable.

Results: Non-compliant patients with glaucoma presented significantly higher anxiety, depression and psychosomatic scores in comparison to the compliant patients. In addition, patients that adopted a ‘Maladaptive Defensive Style’ a style that includes most of the immature ego mecha- nisms of defense projection, acting out, regression, autistic fantasy, projective identification, passive aggressive and splitting present lower rates of compliance. The severity of the disease also correlated strongly with non-compliance, whereas educational level and SCL-90-R’s ‘obsess-ives-compulsiveness’ scores were positively predictors for compliance. These results were independent to age, sex and family status (Table 1).

Conclusions: The conclusion of depression, anxiety and maladaptive personality characteristics are independent factors in the complexity of patients with primary open angle glaucoma. These findings may be especially helpful as they implicate ways to intervene and improve compliance in improve glaucoma patients.

References:


P196 TFF1, MUC5AC AND HLA-DR EXPRESSION BY CONJUNCTIVAL CELLS IN CHRONI- CAL ANTIGLAUCOMATOUS SURGERY: A LIGHT AND IMMUNOHISTOCHEMICAL STUDY

C. Baudouin 4, C. Creuzot-Garcher 1
1Université Paris XI, 4Department of Ophthalmology, CHU Br Pôle, Paris, France

P194 PATIENT-REPORTED PROBLEMS IN USING GLAUCOMA MEDICATIONS AND AD- HERENCE TO THERAPY

A.L. Robin 1, B. Sleath 2, D. Covert 3, J. Byrd 4
1Johns Hopkins University, Baltimore, MD, United States of America, 2Univeristy of North Carolina, Chapel Hill, NC, United States of America, 3Acion Laboratories. Fort Worth, TX, United States of America, 4University of North Carolina, Chapel Hill, NC, United States of America

Introduction and aim of study: We investigated self-reported adherence by assessing patient reported problems in using intracocular pressure lowering medications for glaucoma.

Methods: Patients were interviewed in three different practices. A self-administered survey regarding problems or concerns with their glaucoma medications was administered.
P197 DIFFERENCES IN PHYSICIAN RATINGS OF EFFICACY, TOLERABILITY AND PATIENT SATISFACTION BETWEEN LATANOPROST IN THE UNITED STATES AND GERMANY IN OCULAR HYPERTENSIVE PATIENTS


Main outcome measures: The main outcomes measures are physician ratings of efficacy, tolerability and satisfaction with latanoprost in comparison to other antiglaucoma drugs.

Participants: A total of 35 patients receiving long-term treatment for glaucoma, 20 suffering from vernal keratoconjunctivitis and 20 normal subjects with no ocular abnormality or topical treatment.


P200 THE OCULAR SURFACE OF GLAUCOMATOUS PATIENTS RECEIVING TOPICAL TREATMENTS EXPRESS IMMUNE MARKERS RELATED TO BOTH TH1 AND TH2 PATHWAYS

three groups, with almost no significant differences. In contrast, C2CNN was expressed at sig-
ificantly higher levels in glaucomatous eyes. As C2CNN expression in OAG CRSS was sig-
ificantly overexpressed in glaucomatous eyes, compared to normal eyes, but not in the
Conclusion: This study confirms that various chemokine receptors may be overexpressed
by the conjunctival epithelium in chronic ocular surface disorders. Their level of expression
may vary among patients and may be associated with inflammation; affected and non-
damaged Th1 or Th2 cytokine networks could be differentiated by the conjunctival CC/CRSS
proﬁles. Our results strongly evoke that, in contrast to allergic eyes involving the Th2 pathway as expected, local cytokine systems may stimulate Th1 and Th2 cytokine networks, suggesting a combination of allergic and inflammatory, most likely toxic, mechanisms.

References: 1. Baudouin C, Hamard P, Liang H, Creuzot-Garcher C, Bensoussan L, Brignole F. Conjuc-
tival epithelial cell expression of interleukins and inﬂammatory markers in glaucoma patients treated
sion of interleukins,12 in glaucoma patients treated with topical non-steroidal anti-inflammatory

P201 TREATMENT PATTERNs AND PREDICTORS OF PERsISTENCE AND ADHERENCE IN A LARGE, NATIONAL SAMPLE OF INSURED PERSONs WITH OAG OR OAG SUSPION

H Nordstrom, B Nordstrom, E Mozaffari, H.A. Quigley

Johns Hopkins Wilmer Eye Institute, Baltimore, MD, United States of America

Introduction: To determine the predictors of treatment patterns, and predictors of treatment persistence and adherence for glaucoma and suspect glaucoma patients in a nationally representative sample.

Methods: Retrospective cohort study using health insurance claims data of 35,754 new glaucoma patients and 5,265 new open angle glaucoma patients. Linked pharmacy and patient care information were used to assess factors possibly predictive of treatment (argon laser trabec-
uloplasty (ALT), surgery, or oral hypotensives (ALT)) as well as factors affecting persistence and/or adherence in this cohort.

Results: Treatment was prescribed in 42% of glaucoma and 8% of suspects. Women were less likely to receive oral hypotensive therapy (OR = 0.94, 95% CI 0.92, 0.97) compared to men (OR = 0.97 95% CI 0.95, 1.0). Factors other than gender that were associated with greater likelihood of treatment were glaucoma diagnosis, older age, and longer follow-up. Half of those filing a claim for ALT surgery had six months of continuous treatment with their initial medication three years after dispensing. Prostaglandins were associated with better persistence and adherence among patients who continued their initial treatment, compared to those patients initiated on beta-blockers (OR = 0.95 (95% CI 0.90-0.95)).

Conclusions: This preliminary study supports the hypothesis that dorzolamide 2% in eyes with
surgical complications. The eyes with penetrating keratoplasty who received dorzolamide 2%
and timolol in primary open-angle glaucoma suspects. Am J Ophthalmol 2004;137(1 Suppl):
S255-61.

P204 EXPERIMENTAL MODEL OF ENDOTHALMITE DISEASE IN RABBIT BY ANTIB-
OCAMOTUS DRUGS ASSOCIATED TO THE GUARDIAN ORF COUNT OF CORNEA

P Chiradasa*, J.F. Casiraghi*, P.L. Lavena

Hospital de Clinicas, Buenos Aires, Argentina, *Hospital de Clinicas, Buenos Aires, Argentina

Purpose: To determine the endothelial damage after the administration of antiglaucomatous
drugs associated to the guadian orf count of cornea.

Methods: Experimental study in rabbit.

Control: Ten rabbits, between twelve to fifteen months old were obtained from the Research
Center of de Buenos Aires. The animals were treated according to the “Declara-
tion of Helsinki.”

Results: Ten rabbits that received guadian orf count were placed in three treatment groups: Latanoprost 0.001% (right eye) or dorzolamide 2% (left eye), none received another systemic or topical medication. Ultrasound pachymetry was performed on week 0 on 4, 10, and 27, to assess endothelial function. A total of three measurements per eye was required. Furthermore biomicroscopy was performed in search of rejection episodes. The study was a duration of 27 weeks. None of the specimens was evidence of ocular disease before surgery. The twenty penetrat-
ing keratoplasties were performed by one surgeon (CH) at the Keratologic Center of the Uni-
versity de Buenos Aires.

Conclusions: Ultrasound pachymetry: Ultrasound pachymetry was performed every week. The final model included the treatment effect (p=0.008), time effect (p=0.04) and the interaction (0.01). The corneal thickness measures are summarized on table 1. There were no statistically signiﬁcant complications. The rabbits treated with Latanoprost 0.001% did not have there rejection episodes. One of the eyes that received dorzolamide was excluded from the study due to show endophthalmitis.

Acknowledgement: This preliminary study support the hypothesis that dorzolamide 2% in eyes
with penetrating keratoplasty could have a potential negative effect; endothelial damage and graft failure. Ultrasound pachymetry may permit the identification of this changes.

P205 A COMPARISON OF THE FIXED COMBINED DOZARMLIDE AND TIMOLOL VS.
THE FIXED COMBINED OF DORZOLAMIDE AND TIMOLIN IN PATIENTS WITH
ELEVATED INTRACOULAR PRESSURE. A 3 YEAR FOLLOW-UP, NON-RANDOMIZED STUDY

B Pajic*, B Pajic-Eggebueller

Klinik Passau, Osten, Switzerland, *AugenZentrumPajic, Reinach, Switzerland

Purpose: To compare the intracocular pressure (IOP) reducing effect, visual field change and safety of the fixed combination of dorzolamide and timolol with that of the fixed combination of latanoprost and timolol in patients with primary open angle glaucoma.

Design: Non-randomized clinical trial.

Participants: Data of 165 non-normalized patients (dorzolamide/timolol, 83, latanoprost/timolol, 82) were included in this analysis.
Methods: In this 36-month non-randomized study, patients with new diagnosis of glaucoma or ocular hypertension were included. After a fixed combination of timolol/mildronate was started on Latanoprost 0.005% once a day and group 2 (25 patients) was put on timolol patients (P<0.001). The difference between groups was not significant at any time (month 6: P=0.60, month 12: P=0.39, month 24: P=0.41, month 36: P=0.28). Overall, 86.7% and 87.8% of patients receiving dorzolamide/timolol versus latanoprost/timolol, respectively, reported no adverse event.

Conclusion: The fixed combination of dorzolamide/timolol administered twice daily and latanoprost/timolol once daily was both well-tolerated and highly efficacious. The visual field improvement in the dorzolamide/timolol group may have the reason consequently better per fusion conditioned through dorzolamide.

Results: 1. Pajic B. Experience with Cosopt, the fixed combination of Timolol and Dorzolamide, gained in Swiss ophthalmologist's office. Current Medical Research and Opinion 2003; 95:101-2, 1 and 2 respectively. Both Latanoprost and Brimonidine lowered IOP significantly from baseline (p=0.001) at all follow up visits. The IOP lowering effect of Latanoprost was significantly more than Brimonidine (p=0.001) at all follow up visits. Two patients (8%) in each group had conjunctival hyperemia and two (12%) in the latanoprost group had conjunctivitis.

Conclusion: Both Latanoprost and Brimonidine significantly lowered IOP in glaucoma patients. Latanoprost is more than Brimonidine on all follow up visits. Both Latanoprost and Brimonidine are effective and well tolerated in North Indian population.

Methods: A prospective randomized controlled trial was conducted in 50 patients of glaucoma and ocular hypertension in the Medical College and Teaching Hospital, Chandigarh, India. All 50 patients were included. The IOP was started on Latanoprost 0.005% once a day and group 2 was put on Brimonidine 0.2% twice daily.

Results: Mean IOP in loss of IOP was 22.4 mm Hg ± 4.9 and 23.2 mmHg ± 4.8 respectively. The mean IOP at 8 AM was 13.6 mm Hg ± 3.8 and 16.13 mm Hg ± 4.0 in group 1 and 2 respectively. Mean IOP at 12 AM was 12.6 mm Hg ± 3.8 and 15.66 mm Hg ± 3.9 in groups 1 and 2 respectively. Both Latanoprost and Brimonidine lowered IOP significantly from baseline (p=0.001) at all follow up visits. The IOP lowering effect of Latanoprost was significantly more than Brimonidine (>0.01) at all follow up visits. Two patients (8%) in each group had conjunctival hyperemia and two (12%) in the latanoprost group had conjunctivitis.

Conclusion: The use of newer antiglaucoma medications, the glaucomaontrol now has a variety of options in the medical management of glaucoma. Prostaglandins like Latanoprost and c2-adrenergic like Brimonidine are being more prescribed commonly all over the world for the management of primary open angle glaucoma (POAG).

Methods: To evaluate whether morning or evening application of Xalacom® is more effective in lowering IOP, a randomized, crossover, eight-week study was conducted in 19 patients with primary open-angle glaucoma. Patients had to have an IOP difference less than 1 mmHg between the right and left eye in mean diurnal IOP (mean of diurnal IOP measurements at all time points). Patients were excluded from the study condition if they had uncontrolled glaucomatous visual field or visual field with normal visual field with normal visual field with normal visual field. After a washout period of four weeks or longer, patients were hospitalized, and IOP was measured at 10:00, 13:00, 16:00, 19:00, 22:00, 1:00, 3:00, and 7:00 AM with a Goldmann applanation tonometer. They were randomly assigned to either morning (07:00 AM) or evening (21:00 PM) application of latanoprost (0.005%) and the other eye, at 22:00 pm (evening dose group). After eight weeks of treat ment, patients were again hospitalized for IOP measurement in the same way as was done when they were untreated. Before treatment, there was no significant difference between both groups in IOP at any time point of measurement or diurnal IOP.

Conclusion: Reduction in the diurnal variation of IOP.

Results: Latanoprost 0.005% once a daily dose group had a mean IOP of 16.3 mm Hg, or 23.5% p=0.002. Four cases had mild hyperemia, and no adverse systemic side effects were reported.

Conclusions: Xalacom® had good pressure lowering effect compared to previous timolol use (0.6 mm Hg difference in favor of the evening application, but this was measured at 24 trough measurement). After a washout period of four weeks or longer, patients were hospitalized, and IOP was measured at 10:00, 13:00, 16:00, 19:00, 22:00, 1:00, 3:00, and 7:00 AM with a Goldmann applanation tonometer. They were randomly assigned to either morning (07:00 AM) or evening (21:00 PM) application of latanoprost (0.005%) and the other eye, at 22:00 pm (evening dose group). After eight weeks of treat ment, patients were again hospitalized for IOP measurement in the same way as was done when they were untreated. Before treatment, there was no significant difference between both groups in IOP at any time point of measurement or diurnal IOP.

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Conclusion: Latanoprost 0.005% once a daily dose group had a mean IOP of 16.3 mm Hg, or 23.5% p=0.002. Four cases had mild hyperemia, and no adverse systemic side effects were reported.

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Conclusion: Latanoprost 0.005% once a daily dose group had a mean IOP of 16.3 mm Hg, or 23.5% p=0.002. Four cases had mild hyperemia, and no adverse systemic side effects were reported.
P210 EVALUATION OF THE IOP LOWERING EFFECT OF BIMATOPROST AND LATANO- 
PROST IN THE TREATMENT OF NORMAL TENSION GLAUCOMA
R.J. Noecker1, M. Dirks2, M.L. Earl, R.D. Williams2
1University of Pittsburgh Eye & Ear Inst, Pittsburgh, PA, United States of America, 2Black Hills Regional Eye Inst., Rapid City, United States of America
Purpose: Evaluate the IOP-lowering efficacy of bimatoprost 0.03% and latanoprost 0.005% in patients with normal tension glaucoma.
Design: Randomized, double-masked, multi-center clinical trial.
Participants: Sixty patients with a diagnosis of NTG.
Methods: Patients were randomized to either bimatoprost or latanoprost for three months. Diurnal IOP measurements (8 AM, 12 noon, and 4 PM) were recorded at each study visit (baseline, and months 1 and 3). In enrolled patients, the mean of the baseline diurnal IOP measurements was 19.3 ± 3.0 mm Hg, with no measurement > 24 mm Hg and no more than 1 measurement of 23 or 24 mm Hg.
Main outcome measure: IOP lowering after 3 months of treatment.
Results: There were no significant between-group differences in baseline mean IOP at any time point (P=0.221). Both bimatoprost and latanoprost provided significant reductions from baseline IOP. After 3 months of treatment, mean IOP reductions from baseline ranged from 2.8 ± 3.6 mm Hg (15%–22%) with bimatoprost and 2.1 to 2.6 mm Hg (13%–16%) with latanoprost. The overall mean reduction in IOP after 3 months of treatment was 5.4 ± 4.4 mm Hg with bimatoprost and 2.4 ± 3.2 mm Hg (15%–16%) with latanoprost. There were no significant between-group differences in adverse event incidence, clinical success, or any other measures.
Conclusion: Bimatoprost has been shown to effectively lower IOP in patients with glaucoma or normal ocular hypertension in numerous clinical trials. Even in the absence of elevated IOP, IOP lowering can be observed in patients with NTG. Results from this study demonstrate that bimatoprost and latanoprost effectively reduce IOP in patients with NTG. The overall mean IOP reductions were statistically significantly greater with bimatoprost than with latanoprost.

P211 IOP-LOWERING EFFICACY OF BIMATOPROST 0.03% VERSUS LATANOPROST 0.005%: A BILATERAL MONOCLURAL TRIAL
R.J. Noecker1, T. Mundorff2, M.R. Earl1, J. Earl1
1University of Pittsburgh Eye & Ear Inst, Pittsburgh, PA, United States of America, 2Black Hills Regional Eye Inst., Rapid City, United States of America
Purpose: Evaluate the IOP-lowering efficacy of bimatoprost 0.03% and latanoprost 0.005%, using each patient as their own control.
Design: Null hypothesis, investigator-masked, paired-comparison trial.
Participants: Patients (n=83) with bilateral glaucoma or ocular hypertension.
Methods: Patients with an untreated IOP between 22-24 mm Hg and no more than 2 mm Hg between eye was randomized to either latanoprost treated one eye and bimatoprost treated in the other for 2 months. Study visits were at baseline and months 1 and 2.
Main outcome measure: IOP lowering after two months of treatment.
Results: Baseline IOP was similar between latanoprost and bimatoprost treated eyes (24.2 vs. 24.3 mmHg, P=0.1). At month 1, the mean IOP reduction from baseline was 7.7 mm Hg (31.5%) in the bimatoprost treated eyes, compared with 6.4 mm Hg (26.4%) in the latanoprost treated eyes (difference of 1.3 mm Hg, P=0.01). At month 2, the mean IOP reduction from baseline was 7.0 mm Hg (28.5%) in the bimatoprost-treated eyes and 5.7 mm Hg (23.4%) in the latanoprost-treated eyes (difference of 1.3 mm Hg, P<0.001). The most common adverse event with both medications was conjunctival hyperemia (25% in bimatoprost and 15% in latanoprost-treated eyes).
Conclusion: Reducing IOP is the only accepted treatment for glaucoma or ocular hypertension. The difference in IOP lowering between bimatoprost and latanoprost is statistically significant.
P215 CORNEAL EFFECTS OF PROSTAGLANDIN ANALOGUES – SIX MONTH RESULTS

Purpose: To our knowledge this is the first study describing the pathologic skin changes in eyelid specimens from two patients who developed periorbital skin hyperpigmentation following bimatoprost use and to utilize these findings to develop the possible mechanism of periorbital hyperpigmentation.

Aim: To study the histopathologic changes in eyelid specimens from two patients who developed periorbital skin hyperpigmentation following bimatoprost use and to utilize these findings to develop the possible mechanism of periorbital hyperpigmentation.

Method: Two eyelid biopsy specimens from bimatoprost-treated Caucasian patients with periorbital hyperpigmentation and matched controls were processed and examined by light microscopy and transmission electron microscopy (TEM). Melanin granules were counted on fixed serial sections at low (x400) and high (x2500) magnification. Immunohistochemistry was performed with antibodies against S-100, CD3 and CD68.

Results: The specimens showed an increase in the number of melanocytes in the periocular skin. The melanocytes included positive melanocytes with abundant melanosomes that were normal in size but were in different stages of maturation. The number of positive melanocytes in the specimens examined was increased compared to the controls. The pathologic findings and possible mechanisms of periorbital hyperpigmentation in these patients were not previously described.

Conclusions: Periocular skin hyperpigmentation following topical prostaglandin use has been previously described. However, the pathologic findings and the possible mechanism of periorbital hyperpigmentation have not been previously described.

References:

P216 EFFICACY AND SAFETY OF BIMATOPROST COMPARED TO TIMOLOL IN THE TREATMENT OF CHRONIC ANGULAR-CLIQUE GLAUCOMA. THE BIMATOPROST CACG STUDY GROUP

Purpose: Evaluate whether bimatoprost (LUMIGAN$ 0.03%) is clinically more successful in reducing IOP than timolol (0.5%).

Aim: To study the histopathologic changes in eyelid specimens from two patients who developed periorbital skin hyperpigmentation following bimatoprost use and to utilize these findings to develop the possible mechanism of periorbital hyperpigmentation.

Method: Two eyelid biopsy specimens from bimatoprost-treated Caucasian patients with periorbital hyperpigmentation and matched controls were processed and examined by light microscopy and transmission electron microscopy (TEM). Melanin granules were counted on fixed serial sections at low (x400) and high (x2500) magnification. Immunohistochemistry was performed with antibodies against S-100, CD3 and CD68.

Results: The specimens showed an increase in the number of melanocytes in the periocular skin. The melanocytes included positive melanocytes with abundant melanosomes that were normal in size but were in different stages of maturation. The number of positive melanocytes in the specimens examined was increased compared to the controls. The pathologic findings and possible mechanisms of periorbital hyperpigmentation in these patients were not previously described.

Conclusions: Periocular skin hyperpigmentation following topical prostaglandin use has been previously described. However, the pathologic findings and the possible mechanism of periorbital hyperpigmentation have not been previously described.

References:

P217 LONG-TERM IOP-LOWERING EFFICACY AND SAFETY OF TIMOTROPROST IN GLAUCO- MA AND OCULAR HYPERTENSION: BIMATOPROST PIVOTAL TRIAL RESULTS EX- TENDED THROUGH YEAR 4

References:

P218 BIMATOPROST-INDUCED PERIORBITAL HYPERPIGMENTATION: HISTOLOGIC FIND- INGS AND POSSIBLE MECHANISMS

References:
were washed-out from their previous glaucoma medication(s). At the Eligibility Visit, the pa-
tients were instructed to take the masked medication for 1 week and were still blinded to the type of medication they were receiving. No crossover was allowed between the two groups.


Participants: Sixty-five physicians were invited to participate in the evaluation.

Methods: This study was carried out in 2001 and the data was collected from the electronic prescription files of the participating physicians. The data were extracted from the Department of Health, Social Services and Public Safety’s electronic pharmacy prescription system. The prescription data were matched to data on patient characteristics, which included age, gender, and diagnosis.

Results: Nineteen of the sixty-five participating physicians agreed to participate in the study. The majority of the participating physicians were specialists in ophthalmology and the median age of the participating physicians was 50 years (range 25–70). The median number of patients prescribed bimatoprost was 2 and the median number of patients prescribed travoprost was 3.

Conclusion: This study suggests that bimatoprost and travoprost are appropriate therapeutic options for IOP lowering in glaucoma patients.
P224 PHYSICIAN ASSESSMENT OF EFFICACY, TOLERABILITY AND PATIENT SATISFACTION WITH LATANOPROST 0.005% VERSUS TIMOLOL MALEATE in patients with open-angle glaucoma treated with latanoprost and continued within the study on this same medication for at least six months.

Purpose: To compare the efficacy and safety of latanoprost and timolol gel forming solution in OHT patients.

Design: This was a randomized, crossover, investigator-masked, active-control study.

Participants: The participants were primary open-angle glaucoma and ocular hypertensive patients.

Methods: Patients received either once-daily 0.5% timolol GFS (n = 40) or once daily 0.005% latanoprost (n = 35) for at least six months. Patients were then crossed over to the other medication and treated for another 8 weeks (Period 2). Intraocular pressure (IOP) was determined every 2 hours from 8:00 to 20:00 at baseline, and Weeks 8 and 16.

Main outcomes measures: IOP, adverse events, discontinuation rates, physician ratings of efficacy, tolerability and patient satisfaction.

Results: During Period 1, the reduction in mean diurnal IOP in latanoprost-treated patients was significantly greater than in timolol GFS-treated patients (4.8 ± 3.0 mm Hg and -5.5 ± 2.2 mm Hg respectively, P = 0.034). There was also a similar significant reduction from baseline in IOP after switching from timolol GFS to timolol (P < 0.001), not observed when patients were switched from latanoprost to timolol GFS. No clinically significant differences were observed in the incidence of adverse events (latanoprost: 32.7%, with one serious event: hypotony, timolol: 33.3%, with one serious event: bradycardia). In addition, patients treated with latanoprost had a higher discontinuation rate (P = 0.015) and were less satisfied with the treatment (P = 0.001).

Conclusion: Latanoprost is more effective than timolol GFS in reducing IOP and patients switched from timolol GFS to latanoprost have a further significant reduction in IOP.

Persistency and clinical outcomes associated with latanoprost and trabecular route. This may indicate that latanoprost can increase aqueous drainage through the trabecular meshwork, but in eyes with the functional trabecular meshwork partially opened, latanoprost may not have the same effect. This may indicate that latanoprost can increase aqueous drainage through trabecular route. To compare the diurnal IOP reductions induced by latanoprost, travoprost, and bimatoprost in eyes with pseudoexfoliation syndrome associated with elevated IOP.

Methods: Each patient underwent a baseline diurnal (24-hour) IOP curve testing at 6 AM, 9 AM, at noon, at 3 PM, and at midnight by using Goldmann applanation tonometry with slit-lamp. Patients were then randomized to receive either latanoprost 0.005%, travoprost 0.004%, or bimatoprost 0.03% once a day for three months. Diurnal curve testing was repeated at first week, first month, and the third month.

Main outcome measure: Goldmann applanation tonometry. Bimatoprost was discontinued after 324 ±172 days of treatment. Resolution of skin pigmentation occurred at the same rate as in those without prostaglandin treatment. In Caucasians with variable time of onset. The periocular hyperpigmentation is completely reversible 7 days after discontinuation of treatment from the baseline IOP was obtained. IOP were tested with Goldmann applanation tonometry.

Main outcome measure: IOP response to the test drug. The average number of days to onset of pigmentation or number of days until complete resolution of pigmentation, time to pigment resolution, and differences between patients with complete and partial resolution of pigmentation.

Results: Patients with complete resolution of the pigmentation, time to pigment resolution, and differences between patients with complete and partial resolution of pigmentation were graded using an arbitrary scale from 0 to 3. Significant reductions of in IOP at every timepoint measured. Although there was no statistically significant difference in the percentage of eyes that showed complete resolution of pigmentation at subsequent follow up visits after discontinuation of bimatoprost, grade of pigmentation at initial appearance and on discontinuation of bimatoprost, interval between discontinuation of bimatoprost and complete resolution of periocular ocular medications that were started after discontinuing bimatoprost, grade of pigmentation at subsequent follow up visits after discontinuation of periocular pigmentation.

Discussion: Patient satisfaction (n = 289, 82.1%) was significantly influenced number of days to onset of pigmentation or number of days until complete resolution of pigmentation. The periocular pigmentation was graded using an arbitrary scale from 0 to 3. Quantitative analysis to determine associations between bimatoprost-induced pigmentation and baseline demographics and clinical data was performed using the Mann Whitney test and simple regression analysis. The associations analyzed included length of time to appearance of pigmentation, time to pigmentation resolution, and differences between patients with complete and partial resolution of pigmentation.

Conclusion: Periocular hyperpigmentation is caused by cosmetic usage. An uncommon side effect that was observed in a retrospective chart review of these patients. Baseline demographic data and clinical data from patients with complete resolution after the discontinuation of treatment were collected. These included age, gender, topical ocular medications used in conjunction with bimatoprost therapy, interval between initiation of bimatoprost therapy and the onset of pigmentation, intraocular pressure at initiation and discontinuation of bimatoprost therapy, grade of pigmentation at initial appearance and on discontinuation of bimatoprost, interval between discontinuation of bimatoprost and complete resolution of pigmentation, time to complete resolution of pigmentation, time to complete resolution of pigmentation, and differences between patients with complete and partial resolution of pigmentation.

Aim: To describe the clinical and demographic characteristics of bimatoprost-induced periocular hyperpigmentation. Clinical and histopathologic characteristics of prostaglandin-induced iris hyperpigmentation have been thoroughly investigated. There are, however, only isolated case reports of periocular pigmentation reported from the cosmetic use of topical prostaglandins.

Introduction: Clinical and histopathologic characteristics of prostaglandin-induced iris hyperpigmentation have been thoroughly investigated. There are, however, only isolated case reports of periocular pigmentation reported from the cosmetic use of topical prostaglandins.

Methods: Thirty Caucasian patients (28 female, 8 male) with primary open angle glaucoma (n=27) or ocular hypertension (n=9) being treated with bimatoprost subsequently developed periocular skin hyperpigmentation. The mean time of onset was 15.3 months (range 1-72 months) after initiation of topical bimatoprost treatment. In all patients IOP was evaluated by a calibrated applanation tonometry.

Design: Randomized cross-over double-blind study.

Objective: Intraocular pressure lowering effect of latanoprost in patients with primary open angle glaucoma. Latanoprost 0.005%, travoprost 0.004%, and bimatoprost 0.03% significantly lowered IOP: Latanoprost 0.005%, travoprost 0.004%, and bimatoprost 0.03% once a day for three months.

Conclusion: Periocular hyperpigmentation occurred at the same rate as in those without prostaglandin treatment. In the baseline clinical parameters between patients with partial or complete resolution of pigment resolution occurred at the same rate as in those without prostaglandin treatment. In the baseline clinical parameters between patients with partial or complete resolution of pigment resolution occurred at the same rate as in those without prostaglandin treatment. In the baseline clinical parameters between patients with partial or complete resolution of pigment resolution occurred at the same rate as in those without prostaglandin treatment. In the baseline clinical parameters between patients with partial or complete resolution of pigment resolution occurred at the same rate as in those without prostaglandin treatment. In the baseline clinical parameters between patients with partial or complete resolution of pigment resolution occurred at the same rate as in those without prostaglandin treatment.
for the treatment of glaucoma. From the viewpoint of drug compliance, we examined the changes in IOP in patients switched from latanoprost 0.005% to brinzolamide 1% (which requires a lower instillation frequency).

Methods: Double-masked clinical study.
Participants: The subjects were 47 eyes of 30 patients in whom latanoprost had been used for at least one month and 18 eyes of 12 patients in whom brinzolamide had been used for at least one month.
Intervention: Dorzolamide 1% was switched to brinzolamide 0.5%, and the IOP reductions and patient changes in IOP before and after the switch (baseline IOP) and at two weeks after the switch were calculated.
Results: Baseline IOP was 16.9 ± 3.6 mmHg, and 16.3 ± 3.6 mmHg (p=0.0083) at two weeks after the switch to brinzolamide, 16.7 ± 6.6 mmHg (p=0.0083) after four weeks, 16.6 ± 6.1 mmHg (p=0.0305) after two months, 16.6 ± 4.1 mmHg (p=0.054) after three months, 16.4 ± 4.1 mmHg (p=0.0037) after four months, 16.4 ± 4.1 mmHg (p=0.0014) after five months and 16.5 ± 4.0 mmHg (p=0.005) after six months, which showed significant IOP reductions compared with the baseline IOP at all the time points. The percent changes in IOP were 8.6% at two weeks after the switch, 11.8% after one month, 11.2% after two months, 10.8% after three months, 10.2% after four months, 9.0% after five months and 9.5% after six months.
Conclusion: With regard to brinzolamide, not only the lower of initial instillation frequency compared with dorzolamide but also further IOP-lowering efficacy was recognized. We consider brinzolamide therapy to be very useful in the cases where IOP reduction is observed with the adjunctive use of dorzolamide.

References:

P234 THE Efficacy OF Substituting Brinzolamide for Timolol in the Combination Therapy for Patients with normal tension glaucoma or ocular hypertension. The secondary objective was to compare the IOP lowering drugs: Travatan (travoprost 40ug/ml) and Azopt (brinzolamide 1%)

Methods: A total of 82 patients were enrolled in the study, all of which were analysed in the intention-to-treat analysis. The study medications were IOP lowering drugs: Travatan (travoprost 40ug/ml) and Azopt (brinzolamide 1%).

Main outcome measures: The primary endpoints of the study were mean IOP reduction from baseline IOP before administration.

Results: The antiradical activity of the drugs has been reduced in the row Travaprost (81%), Betaxolol hydrochloride 0.5%, Timolol maleate 1.0%, Brinzolamide 0.5%, Latanoprost 0.005% and Timolol 0.5%.

Conclusion: We established experimental glaucoma rat model induced by episcleral vein occlusion resulted in chronic ocular hypertension. For evaluation of antiradical effect of the most widely used ocular hypotensive antiglaucoma drugs, we examined the antiradical properties of the most widely used ocular hypotensive antiglaucoma drugs.

References:

P235 A SIMPLE OPEN LABEL STUDY OF THE Efficacy AND SAFETY of TravatAn AND AZOPT COMBINED THERAPY IN PATIENTS WITH OPEN-ANGLE GLAUCOMA ON OCTAL UPGRADEMENT FOR WHOM ADDITIONAL IOP LOWERING IS REQUIRED

Methods: The patients were divided into two groups: A group of 28 patients with open-angle glaucoma and a group of 12 patients with normal tension glaucoma. Both groups were treated with Travatan (travoprost 40ug/ml) and Azopt (brinzolamide 1%).

Main outcome measures: IOP was measured at baseline and after 4 and 12 weeks of Travatan and Azopt treatment.

Results: Intraocular pressure (IOP) 4, 8 and 12 weeks after the substituting (p<0.001) were 16.9 ± 1.8 mmHg. IOPs 4, 8 and 12 weeks after the switch to brinzolamide, 17.6 ± 6.7 mmHg (p=0.0083) after four months, 9.88% after five months and 10.25% after six months.

Conclusion: Compared to the baseline data with Travatan treatment only, IOP was decreased after the switch to brinzolamide. We consider the use of brinzolamide in the combination therapy (which requires a lower instillation frequency).

References:

P236 STUDY OF ANTIRADICAL ACTIVITY OF THE DRUGS FOR GLAUCOMA TREATMENT

Methods: We established experimental glaucoma rat model induced by episcleral vein occlusion. To develop a method to induce Hsp70 in the optic nerve tissue using experimental glaucoma model applied by cauterization of episcleral vein.

Main outcome measures: The primary endpoints of the study was to develop a method to induce Hsp70 in the optic nerve tissue using experimental glaucoma model applied by cauterization of episcleral vein.

Results: In experimental group with brinzolamide, the expression of bcl-2 and bcl-xl mRNA was increased and that of Bax mRNA was decreased. Brinzolamide-induced changes in bcl-2 and bcl-xl gene expression regulated by brinzolamide in mRNA level was shown sexual localization on Muller cells and retinal cell retinal ganglion cell layer.

Conclusion: Conclusively, brinzolamide in ocular hypertension model play a neuroprotective role effectively by up-regulating BDNF expression, and through anti-apoptotic regulation that diminishes on the maintenance of Muller retinal photoreceptor interactivity in association with increased levels of BCL-2 and BCL-XL.

References:

P237 THE NEUROPROTECTIVE EFFECT OF BRIMONIDINE IN EXPERIMENTAL GLAUCOMA RAt MODEL

Methods: We established experimental glaucoma rat model induced by episcleral vein occlusion resulted in chronic ocular hypertension. For evaluation of neuroprotective effect of brimonidine, we observed mRNA expression level of BDNF and anti-apoptotic molecules, bcl-2 and bcl-xl using RT-PCR method. Also, by evaluating cellular localization of BDNF through immunohistochemistry, we examined that brimonidine has mainly effect to certain cell type under chronic injury.

Results: In experimental group with brimonidine, the expression of bcl-2 and bcl-xl mRNA was increased and that of Bax mRNA was decreased. Brinzolamide-induced changes in bcl-2 and bcl-xl gene expression regulated by brinzolamide in mRNA level was shown sexual localization on Muller cells and retinal cell retinal ganglion cell layer.

Conclusion: Conclusively, brinzolamide in ocular hypertension model play a neuroprotective role effectively by up-regulating BDNF expression, and through anti-apoptotic regulation that diminishes on the maintenance of Muller retinal photoreceptor interactivity in association with increased levels of BCL-2 and BCL-XL.

References:
Methods: Brain's right eye unilateral experimental glaucoma were serially sectioned and 110 µm were cut with a microtome. In the right eyes following fixation, the ganglion cell layer was induced normally but increased progressively after increasing exposure duration. Confocal scanning laser ophthalmoscopy and SEM revealed morphologic change of optic disc at the power of 10.5 W and duration of 0.5-10 minutes. Using the generalized linear models procedure of Statistical Analysis Software (SAS, Cary, NC), neuron shrinkage was compared between the two treatment groups with 4-case cross validation. The multivariate analysis was used.

Main outcome measures: Relay neuron size and number in the LGN.

Results: Compared to vehicle-treated animals, memantine-treated animals showed significantly larger optic disc areas (4.0 ± 3.5 % vs. 23.2 ± 0.1 %, IOP p=0.002) and increased significantly the number of relay neurons (4.1 ± 2.8 vs. 23.2 ± 0.1 %, P = 0.044), respectively. For layer 6, this difference was not statistically significant (43.2 ± 3.1 vs. 23.2 ± 0.3 %; P = 0.10).

Conclusions: Memantine protects neurons from shrinkage in the lateral geniculate nucleus (LGN) and after transient retinal ischemia. This finding supports the hypothesis of NMDA excitotoxicity in the pathobiology of degenerative changes in the brain in glaucoma.

This work was supported in part by Glaucoma Foundation, NY, E.A. Baker Foundation to Prevent Blindness Canada National Institutes of Health and University of Toronto (Allergan Research Contract), Glaucoma Research Society of Canada; Foundation for Eye Research.

References:
Inatani M, Kido N, et al. Effects of protein kinase inhibitor, HA1077, on intraocular pressure and cannabinoids were separated and subjected to liquid chromatography-mass spectrometry.

Results: Twenty three patients were included from the following groups: 20 mg D9-THC, 40 mg CBD, 40 mg CBD, or placebo. The effects at a single centre using cannabis based medicine extracts (CBME) of D9-THC and CBD.

In rabbits and monkeys, administration of 0.01% to 0.1% Y-39983 induced a significant increase in outflow facility, and may be a useful therapeutic drug for the treatment of glaucoma.

Conclusions: The wound area of the untreated cultures healed completely after 22.4±5.83 hours, the one treated with DMSO after 29.0±3.12 hours. WIN 55,212-2 prevented the wound healing completely leading to cell death. Incubation of the cell cultures with AM51 10-12 hours before the addition of WIN 55,212-2 (1 μM/ml) resulted in complete wound closure. However, when AM51 and WIN 55,212 were added simultaneously to the cell monolayer, wound healing was not prevented.

Conclusions: CB-memory enhancers may be effective in the treatment of glaucoma, and their potential use in glaucoma drug therapy is encouraged. Further therapeutic studies are necessary to decide upon the significance of CBME in glaucoma therapy.

References:
1. Hepler RS, Frank IR. Marijuana smoking and intraocular pressure (letter). Journal Ameri-

P248 EFFECTS OF SYNTHETIC CANNABINOID WIN55212-2 IN CORNEAL EPITHELIAL WOUND HEALING IN VITRO

Methods: Compared to placebo, two hours after sublingual administration of 5mg D9-THC, the higher dose of CBD (40mg) produced a transient IOP elevation at four hours after administration (p<0.025). Visual acuity slightly decreased in the Taurine and cannabis eye, but remained stable in the CBD eye. However, the higher dose of CBD (40mg) produced a transient IOP elevation at four hours after administration (p<0.025). Visual acuity slightly decreased in the Taurine and cannabis eye, but remained stable in the CBD eye.

Conclusions: Sublingual administration of 20mg CBD did not reduce the IOP but is well toler-
ated, whereas 40mg CBD can produce a transient increase in IOP. A single sublingual low dose of CBD (5mg) did not reduce IOP, and experimental studies are necessary to decide upon the significance of CBME in glaucoma therapy.

References:
1. Hepler RS, Frank IR. Marijuana smoking and intraocular pressure (letter). Journal Ameri-

P249 INTRAOCULAR PRESSURE-LOWERING EFFECTS OF TOPICAL ADMINISTRATION OF Y-39938, A NOVEL SELECTIVE RHO-ASSOCIATED PROTEIN KINASE INHIBITOR

Methods: The topical administration of Y-39938 in eyes of rabbits and monkeys. Additionally, pharmacokinetics was evaluated with radioactive and non-radioactive Y-39938.

Results: In rabbit and monkey eyes, administration of 0.01% to 0.1% Y-39983 induced a significant increase in outflow facility, and may be a useful therapeutic drug for the treatment of glaucoma.


Methods: Methods: The levels of endocannabinoids 2-AG, AEA, and PEA were quantified in human eyes by 44% in the ciliary body and PEA levels by 40% in the ciliary body and by 54% in the choroid.

P242 THE EFFECT OF A SINGLE SUBLINGUAL CANNABINOID ADMINISTRATION ON IOP IN PATIENTS WITH GLAUCOMA. A PLACEBO-CONTROLLED CROSSOVER STUDY

Introduction: The cannabinoids D9-tetrahydrocannabinol (D9-THC) and cannabinol (CBD) cannot be used in the treatment of glaucoma. However, their topical administration has been reported to reduce the intraocular pressure (IOP), but is associated with psychotropic side effects. CBD has neuroprotective actions and does not induce any psychotropic side effects.

Results: Compared to placebo, two hours after sublingual administration of 5mg of D9-THC, the IOP was significantly reduced (p<0.026). Neither dose of CBD reduced the IOP at any time.

Conclusions: The wound epithelium has CB1 receptors, although their function in this tissue is unknown.

Methods: Methods: Two AG, PEA, and AEA in corneal extracts were measured in chloroform/methanol. Distilled water was used as an internal standard. Western blots were used to determine the differences between 2-AG and AEA levels were pronounced in the human eyes compared to other mammalian tissues, where 2-AG levels typically exceed those of AEA by at least 10-fold.

Conclusions: These differences between 2-AG and AEA levels are pronounced in the human eyes compared to other mammalian tissues, where 2-AG levels typically exceed those of AEA by at least 10-fold.

References: Meier, J. D.; Chen, T. L.; Tzu, S.; Venaca, A.; Nieves, V.; Di Marzo, V.; Woodward, R.; Institute of Biomolecular Chemistry CNR, Pozzoli (Napoli), Italy; Dept. of Bioeciences, Alegera, Irvine, CA, United States of America

Purpose: Synthetic cannabinoids and their endogenous ligands, endocannabinoids, have been reported to lower intraocular pressure 1. We investigated the levels of the endocannabinoids 2-arachidonoyl glycerol (2-AG), anandamide (AEA), and palmitoylethanolamide (PEA) as an ‘‘entropy compound’’ in different ocular tissues from normal or glaucomatous donors.

Methods: Methods: Twelve normal and glaucomatous samples have been used for these studies.

Methods: Methods: 2-AG, PEA, and AEA in corneal extracts were measured in chloroform/methanol. Distilled water was used as an internal standard. Western blots were used to determine the differences between 2-AG and AEA levels were pronounced in the human eyes compared to other mammalian tissues, where 2-AG levels typically exceed those of AEA by at least 10-fold.

Conclusions: These differences between 2-AG and AEA levels are pronounced in the human eyes compared to other mammalian tissues, where 2-AG levels typically exceed those of AEA by at least 10-fold.


Methods: In rabbit and monkey eyes, administration of 0.01% to 0.1% Y-39983 induced a significant increase in outflow facility, and may be a useful therapeutic drug for the treatment of glaucoma.

Conclusions: The wound epithelium has CB1 receptors, although their function in this tissue is unknown.


Methods: The wound area of the untreated cultures healed completely after 22.4±5.83 hours, the one treated with DMSO after 29.0±3.12 hours. WIN 55,212-2 prevented the wound healing completely leading to cell death. Incubation of the cell cultures with AM51 10-12 hours before the addition of WIN 55,212-2 (1 μM/ml) resulted in complete wound closure. However, when AM51 and WIN 55,212 were added simultaneously to the cell monolayer, wound healing was not prevented.

P249 INTRAOCULAR PRESSURE-LOWERING EFFECTS OF TOPICAL ADMINISTRATION OF Y-39938, A NOVEL SELECTIVE RHO-ASSOCIATED PROTEIN KINASE INHIBITOR


Purpose: Synthetic cannabinoids and their endogenous ligands, endocannabinoids, have been reported to lower intraocular pressure 1. We investigated the levels of the endocannabinoids 2-arachidonoyl glycerol (2-AG), anandamide (AEA), and palmitoylethanolamide (PEA) as an ‘‘entropy compound’’ in different ocular tissues from normal or glaucomatous donors.

Methods: Methods: Twelve normal and glaucomatous samples have been used for these studies.

Methods: Methods: 2-AG, PEA, and AEA in corneal extracts were measured in chloroform/methanol. Distilled water was used as an internal standard. Western blots were used to determine the differences between 2-AG and AEA levels were pronounced in the human eyes compared to other mammalian tissues, where 2-AG levels typically exceed those of AEA by at least 10-fold.

Conclusions: These differences between 2-AG and AEA levels are pronounced in the human eyes compared to other mammalian tissues, where 2-AG levels typically exceed those of AEA by at least 10-fold.


Methods: Patients with OAG who used aspirin daily for greater than 23 months. Controls were patients with OAG who never used aspirin. We performed a retrospective chart review of 23 eyes of 23 patients who used aspirin (250 mg or less) daily for greater than 2 years. The mean age of the patients was 80.3 ± 7.5 years (mean ± SD).

Results: The percentage of patients who had a decrease in the IOP of at least 10% was 52% (95% CI: 38-66). The mean IOP of the patients who used aspirin was 27.2 ± 6.3 vs. 31.7 ± 7.1 mmHg in the controls (p = 0.005). The mean IOP of the patients who used aspirin in the right eye was 26.5 ± 5.8 vs. 31.3 ± 6.7 mmHg in the left eye (p = 0.002).

Conclusions: These results suggest that aspirin may have a role in the treatment of patients with OAG. Further studies are necessary to confirm these findings.

References:
P254 FINGER MASSAGE VS A NOVEL MASSAGE DEVICE POST TRABECULECTOMY

G. Poyser, Y. Tan, Z. Bong, E. Sparks, S.E. Brown

1. Sydney Eye Hospital, 2. Sydney Medical School, Sydney, USA

Purpose: To assess the efficacy of Nd:YAG iridotomy as a therapeutic treatment in patients with primary angle closure glaucoma (PACG). The efficacy of the treatment is related to the long term intraocular pressure outcome and assessment of the visual field status.

Methods: The study enrolled 60 patients with PACG who have undergone Nd:YAG iridotomy and had undergone 360° of treatment of the pigmented cells and tissues from collateral thermal damage. The study followed the inclusion criteria for the treatment of PACG.

Results: The results showed a statistically significant decrease in IOP following the treatment. The visual field results followed a stepwise progression in the treatment.

Conclusion: Nd:YAG iridotomy is a safe and effective treatment for PACG, with significant improvement in IOP and visual field.

References:

P258 ARGON LASER TRABECULOPLASTY COMPARED TO SELECTIVE LASER TRABECULOPLASTY IN PATIENTS WITH OR WITHOUT PRIOR ARGON LASER TRABECULOPLASTY

M. Birn

1. Sheba & Women’s College H.S.C., Toronto, Canada

Purpose: Selective laser trabeculoplasty (SLT) is a new version of laser treatment for lowering intraocular pressure (IOP) in patients with chronic open angle glaucoma. Studies have shown effectiveness as primary therapy; this study was intended to examine results in patients who had prior argon laser trabeculoplasty (ALT) to 360° of their trabecular meshwork compared to those who had not had ALT and to those having ALT who had not had prior laser.

Participants: One hundred and six patients requiring lower intraocular pressure, for whom laser therapy had been recommended.

Methods: All subjects were given 180 degrees of laser trabeculoplasty. Thirty subjects were having SLT for the first time, 38 were having ALT as their first laser treatment, and 37 were having ALT after having had 360° of ALT therapy previously.

Main outcomes measures: Intraocular pressure as reported prior to the laser and 4.5 months later.

Results: All three groups of patients experienced a statistically significant decrease of IOP at 4.5 months following the laser treatment. However, there were no statistically significant differences between the groups either for prelaser or postlaser IOP.

References:

P259 INTRAOCULAR PRESSURE AND VISUAL FIELD ASSESSMENT FOLLOWING ND: YAG IRIDOTOMY IN PRIMARY ANGLE Closure GLAUCOMA

D.V. Dimovska, Dz. E. Dzajkovska, R.K. Bistritzer, V. Vesna Dimovska

University Eye Clinic, Skopje, Macedonia

Purpose: To assess the efficacy of Nd:YAG iridotomy as a therapeutic treatment in patients with primary angle closure glaucoma (PACG). The efficacy of the treatment is related to the long term intraocular pressure outcome and assessment of the visual field status.

Methods: The study enrolled 60 patients with PACG who have undergone Nd:YAG iridotomy and had undergone 360° of treatment of the pigmented cells and tissues from collateral thermal damage. The study followed the inclusion criteria for the treatment of PACG.

Results: The results showed a statistically significant decrease in IOP following the treatment. The visual field results followed a stepwise progression in the treatment.

Conclusion: Nd:YAG iridotomy is a safe and effective treatment for PACG, with significant improvement in IOP and visual field.

References:

P259 CLINICAL STUDY OF THE SELECTIVE LASER TRABECULOPLASTY FOR PRIMARY OPEN ANGLE GLAUCOMA: SIX-YEAR FOLLOW UP

K. Varkey

1. Medical University Hospital ‘Alexandrov’, Sofia, Bulgaria

Introduction: The Selective Laser Trabeculoplasty (SLT) targets only pigment-laden cells (containing melanin chromophores) from the trabecular meshwork, thus protecting the adjacent non-pigmented cells and tissues from collateral thermal damage.

Purpose: In order to establish the long-term (six-year follow up) laser trabeculoplasty for primary open-angle glaucoma.

Main outcomes measures: Intraocular pressure as recorded prior to the laser and 4.5 months later.

Results: All three groups of patients experienced a statistically significant decrease of IOP at 4.5 months following the laser treatment. However, there were no statistically significant differences between the groups either for prelaser or postlaser IOP.

References:

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Main outcome measures: 

- IOP: 
  - Without medical treatment (baseline) average (±SD) IOP was 27.7 ± 2.6 mm Hg; with medical treatment 19.1 ± 3.5 mm Hg; at three months after SLT failure rate was 21%; at six and nine months failure rates were respectively 23%, 24% and 27%. The IOP in the treated eyes was significantly lower and blebs were respectively 19.1 ± 2.1, 18.7 ± 1.9 and 18.8 ± 2.0 mm Hg. The difference between medical treatment and SLT was not significantly different at all points of time; the difference between baseline and SLT was statistically different (p<0.01). Failures were slightly more frequently observed in lightly pigmented eyes.

Conclusion: 

In 12 cases of long-term outcomes of selective laser trabeculoplasty laserargon beam was used. In all cases the blebs were stable and functional. The mean decrease of IOP was 10.4 mm Hg at 6 months follow-up. No major complications were reported in either of the two groups.

References: 

1. Soroudi P: Study ab interno excimer trabeculotomy shows good IOP lowering effect, sta-
bul, Turkey. ESCRS Munich 2003. 

P263 POST SELECTIVE LASER TRABECULOPLASTY (SLT) INTRACULAR PRESSURE (IOP) SPIKES IN PIGMENTARY GLAUCOMA: A CASE SERIES WITH ANALYSIS. P. Harasymovy,1 D. Papamatheakis,1 M. Leck,1 M. Latina,1 M. DeLeon2, K. Damji1. 
1University of Pennsylvania, Philadelphia, PA; 2Washington University, St. Louis, MO.

Purpose: To illustrate the complication of intraocular spikes pressures following selective laser trabeculoplasty (SLT)1 in patients with pigmentary glaucoma, hypothesizing that patients with more advanced disease are more prone to post-selective laser trabeculoplasty intracu-
lar pressure spikes.

Design: Multi-center, nonrandomized, noncomparative, retrospective and interventional case series.

Patients: Four patients (four eyes) with pigmentary glaucoma in four glaucoma subspecialist clinical practices.

Methods: Selective Laser Trabeculoplasty was performed for lowering medically unreconched intraocular pressure in these patients. Their postoperative intraocular pressure was monitored.

Outcome measures: Intracocular pressure spikes post-procedure were noted and patients were managed according to physician discretion.

Results: A case series of four patients is presented.

Conclusions: Post-procedural IOP spikes are a serious adverse event in some cases of se-
lective laser trabeculoplasty. Possible causes for the IOP spike include: selective targeting of melanin and pigmented cells or collagen of collagen beams, as well as destruction of remaining trabecular meshwork cells and risk factors may include advanced TM damage present before the laser therapy, previous argon laser trabeculoplasty treatment andprevious IOP spikes with laser iridotomy. Additional studies are needed, to further investigate and clarify this phe-
nomenon.

References: 


P264 SELECTIVE LASER TrABECULOPLASTY WITH Nd:YAG LAGER IRIDOTOMY IN PIG-
MENTARY GLAUCOMA A. Wojcik, S. Dukor, A. Golab, P. Sowa, and M. Marciak. 
Department of Ophthalmology and Oculoplasty, John Paul II Hospital, Krakow, Poland

Purpose: To examine the effect of combined procedure: selective laser trabeculoplasty (SLT) pre-
retreated with Nd:YAG – iridotomy (IORT) on the morphology of indo-corneal angle and intracu-
lar pressure (IOP) in patients with pigmentary glaucoma (PG).

Methods: Forty two eyes of 21 patients with a diagnosis of pigmentary glaucoma were stud-
ied. Average IOP, despite topical fornix blocking (timolol + dorzolamide), was 25.1 mm Hg. Ul-
trasound biomicroscopy (UBM) was performed in each case before further procedure. Seventeen of thirty eyes showed iris contact with ciliary processes, which was associated with increased iris-lens contact in UBM examination. Twenty one eyes, with concave iris inclu-
sive, of were treated with laser iridotomy. Control UBM examinations were done in a week after the first procedure. Then all 42 eyes underwent selective laser trabeculoplasty. Twenty one eyes with only SLT performed made up the control group. IOP was measured after 1 week and 3 and 6 months after trabeculoplasty.

Results: In all cases of posterior iris bowing iridotomy flattened the iris and increased the distance from lens. In 12 cases of regular iris UBM did not reveal any changes of indo-corneal morphology. IOP after iridotomy was not significantly lower in both groups. After trabeculoplasty pressure reduction was significant: on average 20.8% (range 0 – 34.1%) during 6 months in both groups with no difference between themselves. Observed complications are described in the paper.

Conclusion: SLTs is an effective hypotensive method in pigmentary glaucoma management.

Laser iridotomy can be effective prophylactic treatment of reversed papillary block in PG. SLT performed with IORT appears to be significantly more effective than SLT itself in lowering the intraocular pressure in PG during first 6 months after treatment but these patients are going to be observed continually.

P265 COMPARISON OF THE SLT LAMP AND ULTRASOUND BIOMICROSCOPIC FINDINGS OF THE FILTERING BLEB AFTER MMC TRABECULECTOMY BETWEEN WITH FORNIX-
BASED AND WITH LIMBUS-BASED CONJUNCTIVAL FLAPS T. Fujiki, H. Ueda, K. Ichimura. Aichi Graduate School of Nagoya University, Chikusa-ku, Nagoya, Japan.

Introduction: MMC trabeculectomy with fornix-based conjunctival flap (FB) has a tendency to form flatter, more diffuse and vascularized blebs by comparison with that with limbus-based conjunctival flap. This may be a key to prevent long-standing postoperative complications.

Aim of the study: We compared bleb forms and ultrasound biomicroscopic (UBM) findings after MMC trabeculectomy between with FB and with LB.

Methods and methods: Eighty one consecutive cases, including POAG, NTG, Exfoliation glaucoma, glaucoma with uveitis and others, underwent MMC trabeculectomy ei-
ther with FB (38 eyes) or LB (47 eyes). Postoperative intraocular pressure (IOP) was followed up to 36 months. Slit lamp examination and UBM examination were performed between 6 and 12 month postoperative periods.

Purpose: To present new clinical trial data on the glaucoma surgical technique: Eximer La-
er trabeculoplasty (ELT), a new laser technique developed for laser trabeculoplasty and meshwork obstruction, in open angle glaucoma.

Methods: Pros. and Gries and Prof. Kleinknecht conducted a six-month nonrandomized clinical trial comparing the effect of steroids (20 eyes), and NSAIDS (20 eyes), in eyes which underwent ELT, and steroids (20 eyes) in eyes which underwent ELT combined with Phaco-CE. Patients were followed for six months postoperatively.

Results: Pros. and Gries and Kleinknecht reported a statistically significant mean IOP decrease of 9.4 mm Hg (ELT + steroids) and 11.1 mm Hg (ELT + 0.1% CE + steroids) at six months follow-up. Prof. reported a statistically significant mean IOP decrease of 10.4 mm Hg at 6 months follow-up. No major complications were reported in ei-
ther of the two groups.

Conclusion: ELT is an effective and safe treatment for open-angle glaucoma both alone and in combination with leasycotomy.

References: 

1. Mazzotta M, Tumbocon JA. Se-

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Results: While postoperative IOP with FB dropped from 21.3 ± 6.7 mmHg preoperatively to 9.9 ± 2.4 mmHg at 12 months, with LBC it dropped from 21.1 ± 6.2 mmHg to 7.4 ± 2.2 mmHg. Although initial IOP drop with LBC was statistically significant compared to baseline, IOP values were not significantly different between LBC and FB at each follow-up visit. However, the difference in maximum IOP between the two treatment groups was significant:

Conclusions: We were able to make less long-standing complications, such as button-hole, bleb leak, and postoperative infection, after MMC trabeculectomy by use of FB.

References:

P266 THE DEVELOPMENT OF TRABECULECTOMY FILTER BLEBS – AN ANALYSIS BY SLIT LAMP ADAPTED OPTICAL COHERENCE TOMOGRAPHY

T. Theelen, T.B.F. Hogewind

Introduction: Early postoperative development of filter blebs is critical for the long-term success of glaucoma surgery and timely identification of scarring may prevent surgical failure effectively. Slit-lamp adapted optical coherence tomography (SLOCT) is a non-contact device that can illustrate deep tissue layers in the anterior eye segment, which makes it particularly valuable for early postoperative filter bleb imaging.

Aim of the study: To study the development of filter blebs by SLOCT and to compare it with clinical findings.

Methods: In this prospective, non-randomized trial we studied 15 eyes of 15 patients undergoing primary trabeculectomy with or without use of antimetabolites, including 7 patients with advanced glaucoma who were then randomized into 12-hour routine clinical discharge and 24-hour discharge groups. In addition, 3 patients with scleral flap applanation tonometry, participating patients had slit-lamp photography and SLOCT of the bleb at day 1, day 2, 1, 2 and 12 postoperatively. We analyzed SLOCT results using visualization criteria based on SLOCT images.

Results: All filter blebs could be visualized completely by SLOCT. Higher bleb volume and lower bleb reflectivity was correlated with lower intracutaneous pressure. Tenon cyst formation was precluded in the blebs with increased reflectivity on SLOCT.

Conclusion: Examination by SLOCT offers additional information about postoperative bleb development. Comparison between SLOCT and clinical finding may be helpful in the detection of the early postoperative complications of glaucoma surgery.

References:

P267 DOES SLICRAL FLAP SIZE INFLUENCE INTRAOCULAR PRESSURE CONTROL IN TRABECULECTOMY USING ADJUSTABLE SUTURES?

W. Burchat, A.P. Wails

Introduction: Trabeculectomy using a small scleral flap may provide comparable medium-long term IOP control to large flap techniques, and has potential benefits: reduced surgical trauma, lower risk of bleb leak or postoperative infection, after MMC trabeculectomy by use of FB.

Objective: To compare the effect on intraocular pressure (IOP) of large versus small scleral flap sizes during trabeculectomy using adjustable sutures.

Methods: Standardised trabeculectomy operations were performed on nine donor human eyes connected to a constant flow infusion. Baseline IOP was set between 24 and 32mmHg with real-time contact tonometry, including 6 mm annulus appplanation tonometry. The IOP in each eye was then adjusted to 15mmHg with adjustable sutures. Flap sizes were increased by 4mm in each flap to the next largest standard size. The comparison was done in a random order to prevent bias. Flap sizes consisted of 46mmx46mm, 50mmx50mm, 54mmx54mm, 58mmx58mm, and 62mmx62mm.' Tight flap closure with adjustable sutures allows controlled manipulation of IOP post-operatively, minimising hypotony risk and sequelae. Therefore, the aim of this study was to investigate the effect on IOP of both large and small flaps using 4-throw adjustable sutures in an experimental model.

Aim of the study: To compare the effect on intraocular pressure (IOP) of large versus small scleral flap sizes during trabeculectomy using adjustable sutures.

Conclusions: The 46mmx46mm flaps (44mmx44mm, 48mmx48mm, 52mmx52mm, n=9) were constructed over 0.8mm scleroma, with evenly distributed sizes. For each procedure, baseline IOP was 24mmHg, with a maximum IOP of 24 and a minimum IOP of 15mmHg. No significant differences were found between the two treatment groups.

P268 VISUAL OUTCOME ONE YEAR FOLLOWING FILTERING SURGERY IN END-STAGE GLAUCOMA

F. Topouzis, A. Koskosas, Th. Pappas, E. Anastasopoulos, P. Tranos, S. Dimitrakos

Introduction: The aim of this study was to evaluate the visual outcome at 1 year following primary trabeculectomy or deep non-penetrating sclerectomy. We examined the effect on IOP of both large and small flaps using 4-throw adjustable sutures in an experimental model.

Results: After the procedures in eyes, five had flaps that were thin or poorly constructed. There were 3 reoperations due to a high IOP of 7mmHg (trabeculectomy or deep non-penetrating sclerectomy). Eight eyes had good outflow resistance prior to closure. Following flap closure mean IOP was 20mmHg (SD ± 5). The perfluoropropane gas bubble (mibefradil, 26%) was used to try to decrease IOP.

Conclusion: The risk of postoperative visual loss in advanced glaucoma increased to a matched non-operated eyes.

References:

P270 IN VIVO CONFOCAL MICROSCOPY STUDY OF BLEBS AFTER FILTERING SURGERY

A. Labbe, B. Dupas, P. Hamard, C. Baudouin

Aim: To evaluate the structure of the inner layer of the filtering blebs with the Heidelberg Retina Tomograph II (HRT II, Heidelberg Engineering, Heidelberg, Germany) and to analyze the risk of trabeculectomy failure due to scarring of the trabeculum or the bleb base.

Methods: This is a prospective, non-randomized clinical trial. Informed consent was obtained from 20 patients suffering from primary open-angle glaucoma. Inclusion criteria were a visual field sensitivity of less than 5dB and in mean sensitivity of the four central visual field points of less than 5dB.

Results: Primary indications for filtration surgery were an average IOP of 28.3±10.5 mmHg. In all patients, the HRT II showed a dense filter bleb with a sensitive area of 0.07±0.16 mm² and a sensitivity of 0.98±0.01 dB. The sensitivity of the adjacent ocular tissues was 24.4±10.4 dB. The sensitivity of the adjacent ocular tissues was 24.4±10.4 dB. The sensitivity of the adjacent ocular tissues was 24.4±10.4 dB.

Conclusion: Early postoperative development of filter blebs is critical for the long-term success of glaucoma surgery and timely identification of scarring may prevent surgical failure effectively. Slit-lamp adapted optical coherence tomography (SLOCT) is a non-contact device that can illustrate deep tissue layers in the anterior eye segment, which makes it particularly valuable for early postoperative filter bleb imaging.

References:

P279 IN VIVO CONFOCAL MICROSCOPY OF FILTER BLEBS AFTER TRABECULECTOMY

A. Labbe, B. Dupas, P. Hamard, C. Baudouin

Introduction: In vivo confocal microscopy is a promising new method to understand wound healing mechanisms after filtration surgery.

Methods: In vivo confocal microscopy images were analyzed for number of intraepithelial microcysts, density of subepithelial connective tissue, presence of blood vessel, and presence of fibroblastic tissue.
References:

12. Holladay JT, Dudeja DR, Koch DD. Evaluating and reporting postoperative astigmatism: The Würzburg bleb classification score aims for an objective assessment and a quantitative analysis with a favourable interobserver variability and consistent therapeutic decision making.
13. P274 NEW APPROACH TO LIMBUS-BASED TRABECULECTOMY WITH ADJUNCTIVE 5-FU: OBTAINING SHORT LINEAR CONCATINATAL SEGMENTS IN PSEUDOEXFOLIATION GLAUCOMA. A RETROSPECTIVE STUDY.
P278 EFFECTS OF INTRAOPERATIVE INTERCED AND SURGICEL ON WOUND HEALING REACTION AFTER GLAUCOMA FILTRATION SURGERY

N. Akyol, N. Akpolat
Feat University, Elazig, Turkey

Introduction: Materials that suppress the fibrovascular activity on the glaucoma filtration site are expected to diminish healing reaction in low-tension glaucoma surgery. The aim of the study was to evaluate and compare the effectiveness of two oxidized regenerated cellulose material; Interced and Surgicel on wound healing reaction after glaucoma filtration surgery.

Methods: Trabeculectomy with a limbal based conjunctival incision and a full thickness scleral flap was performed in 32 patients. Interced or Surgicel were placed in the conjunctival area evaluated by: cell counts (fibroblast, lymphocyte, macrophage), number of vessels; presence of foreign body reaction and opacity of the flap tract.

Results: There was no statistically significant difference among the groups with respect to intraocular pressure, anterior chamber depth and bleb appearance in any taken day. The number of fibroblasts in groups 1 and 2 was higher than that in group 3. The number of the lymphocytes was significantly decreased in group 1. There was no statistically significant difference among the groups with respect to number of the fibroblasts, the amount of fibrosis and anterior chamber depth. There were not detected statistically significant differences among the groups with respect to intraocular pressure.

Conclusions: This study shows that, both of these adhesion preventing substances seems to suppress vascularisation. In spite of no significant suppression in wound healing reaction after trabeculectomy surgery, reliance on their proven efficacy for preventing adhesions in abdominal and ocular surgery, we consider to continue our studies on larger groups.


P279 CILIARY BODY TISSUE IN COMPARISON TO SUBCONJUNCTIVAL SURGAR IN COMPARISON TO MITOMYCIN-C IN THE RABBIT EYE: DETERMINATION OF THE TOXIC CONCENTRATION

A. Akman, A. Gun, B. Bilizci, Y. Akova
Basket University, Ankara, Turkey

Purpose: This study was carried out to identify the toxic levels of suramin to compare with mitomycin-C (MMC) - as subconjunctival adjunctive agents in trabeculectomy- by investigating the correlation of the damage in the ciliary epithelium and the severity of adhesions.

Design: Experimental study

Participants and methods: Thirty-four New Zealand rabbit albino rabbits were distributed into two equal groups so that either receiving suramin or MMC subconjunctivally in the right eye. Survivum group received 200, 400, 600 and 800 mg/ml injections, and MMC group received 0.2, 0.3, 0.4 and 0.8 mg/ml injections. Two rabbits injected with balanced salt solution served as controls. The groups were further divided into four subgroups and the rabbits were sacrificed at 1st, 7th, 28th and 90th days. The enucleated globes were dissected out and half of the enucleated globes was put into 10% formaldehyde for light microscopic evaluation and was further processed for apoptosis evaluation. The other half was placed in 2.5% formaldehyde for transmission electron microscop (TEM) evaluation.

Main outcome measures: Histopathologic evaluation of specimens for determination of toxic concentration of suramin and MMC in the ciliary body

Results: The pathologic investigation revealed apoptosis in only 4 specimens. All apoptotic specimens were seen in MMC group, but there was no statistically significant difference of apoptosis with a particular MMC concentration. The morphology of apoptotic cells with TEM showed that 200 mg/ml MMC caused apoptosis with 0.2 mg/ml MMC did not cause irreversible tissue damage in the ciliary epithelium. Higher concentrations of MMC led to formation of a fibrovascular wall with the suramin treated globe. However the damage was moderate and it occurred later with suramin in excess of 200 mg/ml.

Conclusions: Suramin 200 mg/ml and MMC 0.2 mg/ml seem harmless to the ciliary body in rabbit eye. Concentrations higher than these values caused irreversible damage.

Results: The majority of blebs were classified as either 50% (moderate size) or 75% (large size) of the full bleb area. A trend was noted for a reduction in mean intrabulbar pressure with increasing bleb size. For small blebs the mean IOP = 16.6 ± 5.8 mm Hg, moderate blebs 14.3 ± 5.8 mm Hg (SDs) and large blebs 13.9 ± 5.8 mm Hg. For each documented bleb size the mean IOP was lower in group tranilast than in group placebo (p < 0.05). The IOP in group placebo at 2 weeks exposure was 31.6 ± 13.1 mm Hg (± SD) and placebo at 4 weeks exposure was 3.6 ± 13.1 mm Hg with a 2 week exposure periods. Intraoperative 5FU as a single dose of 50 µg/ml (24 hours after confluence) and 25 µg/ml (p<0.05) and 50 µg/ml (p<0.01) in a dose-dependent manner (Fig.1). And there was significant statistical difference between the ratio of TF-β3/G3PDH PCR products signal in- tendent in the experimental groups treated with tranilat at 25 µg/ml (p<0.01) and that of the control group. 12.5 µg/ml tranilat did not affect the ratio significantly (Fig.2).


References:
Aims: The study was conducted to evaluate the underlying risk factors for bleb injection after glaucoma filtration surgery. Scarring of the filtering bleb is a major cause of bleb failure after trabeculectomy, and surgical management of dissecting bleb leaks. Ophthalmology 2002; 109: 71-75.

Methods: Inclusion criteria were as follows: (1) operated: six eyes with neovascular glaucoma, two with pseudophakic glaucoma, two with primary angle-closure glaucoma, and one with traumatic glaucoma predisposed to early bleb failure, and conjunctival suture with 10-0 nylon showed less effect on scarring compared with 9-0 silk.

Results: Two factors out of nine were statistically significant, (1) elder patients compared with younger patients (P = 0.006; RR = 0.40; CI: 0.21-0.77) and (2) surgical history in the upper half of the eye (P = 0.043; RR = 0.25; CI: 0.10-0.63). Other factors were as follows, (3) gender: male versus female (P = 0.62; RR = 1.00; CI: 0.42-2.18), (4) type of glaucoma: primary versus secondary (P = 0.087; RR = 0.92; CI: 0.37-2.51), (5) uveitic versus glaucoma (P = 0.23; RR = 0.58; CI: 0.17-2.01), (6) conjunctival incision (limbal-based versus fornix-based) (P = 0.001; RR = 0.34; CI: 0.15-0.76) (7) duration of the eye drop treatment for glaucoma after surgery (P = 0.874; RR = 1.08; CI: 0.53-2.24). The number of eyes before operation (P = 0.009; RR = 2.03; CI: 0.99-4.15), (9) duration of the operation (P = 0.009; RR = 1.08; CI: 0.53-2.24), (10) conjunctival incision (limbal-based versus fornix-based) (P = 0.001; RR = 0.34; CI: 0.15-0.76).

Conclusions: Incidence of bleb injection decreased with age, and increased with past history of cataract surgery. Although statistically insignificant, excision of conjunctiva and neovascular glaucoma predisposed to early bleb failure, and conjunctival suturing with 10-0 nylon showed less effect on scarring compared with 9-0 silk.

References:

P287 FIXATION LOSS AFTER TRABECULECTOMY IN PATIENTS WITH ADVANCED GLAUCOMA: EFFECT OF AGE, TIME AND REGION

T. Koga, M.O. Ogata, M.A. Awai, T.M. Muto, T.I. Inoue, M.I. Inamata, H.T. Tanhara Kumamoto University, Kumamoto, Japan

Objective: To elucidate risk factors related to fixation loss after trabeculectomy in patients with advanced glaucomatous visual field defect (VFD). The aim of this study was to investigate the study of 75 patients with advanced glaucomatous VFD. Trabeculectomy alone was performed in 65 eyes. In the remaining 35 eyes, glaucoma drainage device (GDD) implantation including Ahmed® implantable microshunt (PEA+IOL) combined with trabeculectomy simultaneously (triple procedure). The mean age (a standard deviation) was 88.2 ± 9.1 years old.

Results: In the triple procedure (P = 0.001), the 100 glaucomatous eyes with advanced glaucomatous VFD, irreversible loss of fixation (central vision) occurred. In two of the three eyes, fixation was found within two weeks after trabeculectomy. In the remaining one eye, fixation was lost at one month post-surgery. No significant statistical analysis did not show any gender differences, presbyopic visual acuity. In contrast, preoperative intraocular pressure (IOP) in patients with triple procedure (n = 30) was significantly higher than in that in control group (P = 0.002; mean ± standard deviation, 22.3 ± 6.3 mmHg (n = 97)). Another risk factor was combination of PEA+IOL with trabeculectomy. In all of the 3 eyes with fixation loss, triple procedure and PEA+IOL trabeculectomy was performed.

Conclusions: From our results, we conclude that combination of cataract surgery with trabeculectomy may be a noteworthy risk factor to the onset of fixation loss. Much attention should be paid to IOP levels as a risk factor to the onset of fixation loss.

Clinical Experience With the Ahmed Glaucoma Valve Implant. Huang MC, Netland PA,....

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on this membrane might be responsible for the IOP rise. We postulate that the new valve body (silicone instead of polypropylene) but showed a relative high percentage of early postoperative IOP rise. At this stage, fibrosis cannot be the cause. We postulate that the new valve body (silicone instead of polypropylene) make it susceptible to compression by drained aqueous humor in the sub-conjunctival space cannot be the cause. We postulate that the new valve body (silicone instead of polypropylene)....

References


P292 PRIMARY SINGLE PLATE MOLTENO TUBE IMPLANTATION FOR CHILDHOOD GLAUCOMA ASSOCIATED WITH STURGE-WEBER SYNDROME

Aim of the study

1: To compare between the results of non-penetrating deep sclerectomy with the use of surgery showed no difference between success and failure group.

Conclusion

References

1. Bahler C, Smedley G PhD, et al Tra...

Materials and methods: In 30 highly decompensated trabecular glaucoma cases, with all drainage pathways closed, we performed a drainage operation with a zirconia ceramic implant. Aqueous dynamics after deep sclerectomy: a prospective study. Ophthalmic Eye Hospital Jules Gonin, Lausanne, Switzerland

Results: In our series, postoperative IOP values, need for medications and success rates were similar in all groups. DS with collagen implant appears to provide satisfactory results apart from the first two weeks, then one week thereafter. UBIM and outflow facility measures were successful. One eye recently received a cross-shaped zirconium implant, the other the under surgery without implant. Four groups of two rabbits each went through a follow-up of 1, 2, 4 and 6 months after surgery. The initial pressure drop observed shortly after surgery was followed by a progressive increase to a mean value state lower than the preoperative value. Using a drainage device such as a zirconium implant promotes the initial effect of the surgery. After several months, foreign body reactions and fibrosis might occur that restrain the initial benefit of such procedure, despite good initial biocompatibility.

References:

P300 BIOCOMPATIBILITY OF AN X-SHAPED ZIRCONIUM IMPLANT IN DEEP SCLERECTOMY IN RABBITS

Riy, A. Basio, A. Mermoud

Ophthalmic Eye Hospital Jules Gonin, Lausanne, Switzerland

Objective: To study biocompatibility of ceramic implants in glaucoma surgery.

Comparative study: one eye underwent deep sclerectomy only, the other the deep sclerectomy plus insertion of a zirconium implant.

Materials and methods: Before surgery, ultrasound biomicroscopy was performed, intraocular pressure (IOP) and outflow facility were measured. One eye recently received a cross-shaped zirconium implant, the other under surgery without implant. Four groups of two rabbits each went through a follow-up of 1, 2, 4 and 6 months after surgery. The initial pressure drop observed shortly after surgery was followed by a progressive increase to a mean value state lower than the preoperative value. Using a drainage device such as a zirconium implant promotes the initial effect of the surgery. After several months, foreign body reactions and fibrosis might occur that restrain the initial benefit of such procedure, despite good initial biocompatibility.

References:
Results: The IOP without medication rose from 9-15 mmHg in the first day to 13-18 mmHg – at one day = 18.4 ± 10.9 mmHg (n = 37); at one week = 17.5 ± 5.9 mmHg (n = 37); at six months = 15.6 ± 4.8 mmHg (n = 37); at 12 months = 15.7 ± 5.3 mmHg (n = 37) and 18 months = 15.7 ± 5.3 mmHg (n = 37). The IOP decreased from a mean preoperative value of 31.3 ± 8.7 mmHg to 16.7 ± 6.4 mmHg (n = 37) at 18 months, and 15.7 ± 5.3 mmHg at 24 months postoperatively. The mean postoperative IOP was greater than 21 mmHg at one day = 14.9 ± 6.2 mmHg, at one week = 14.6 ± 3.9 mmHg, at six months = 14.5 ± 4.1 mmHg, and at 12 months = 14.3 ± 3.9 mmHg. The IOP decreased significantly (p<0.05) at 1 week, six months, and 12 months postoperatively. Secondary outcomes included the success rate (IOP≤21 mmHg with or without medication) was 86.9% at 1 year, 84.8% at one year and half, and 72.2% at two years respectively. The success rate was significantly related to the target IOP value, the baseline IOP was 16.9 ± 5.0 mmHg at one year, 14.1 ± 4.8 mmHg at one year and half, and 15.0 ± 6.2 mmHg at two years (p<0.001). There is no significant difference between pre- and post-operative IOP (P=0.00). The rate of complications was similar for trabeculectomy (8.6%) and VCD (6%). The postoperative treatment for complications was micro-perforation of the trabeculo-Descemet's membrane. The final visual acuity (LogMAR) of 0.6% of enrolled patients was improved at the end of follow up. Secondary outcomes (a) changes in visual acuity (LogMAR), (b) % of enrolled patients with improvement of at least 5 ETDRS lines. Statistical analysis was performed on an ‘intent-to-treat’ basis. Power > 90%, alpha probability > 0.05.

Results: Two eyes in Group A and one eye in Group B showed a complete failure (i.e. IOP > 20 mmHg unresponsive to medication + or − β-blockers), and in one of these cases the IOP was 21 mmHg in either eye with or without previous trabeculectomy or laser interventions. Further glaucoma surgery was performed in 8 DS in 2 TE.

Conclusions: (a) trabeculectomy offered a better IOP control than deep sclerectomy seven years after surgery; (b) when deep sclerectomy was converted to a penetrating procedure by means of post-operative Yag-laser gonipuncture, the success rate increased significantly (deep sclerectomy was associated with a lower incidence of cataract extraction.

P307 TRABECULECTOMY VS DEEP SCLERECTOMY. 7-YEAR ANALYSIS OF A PROSPECTIVE RANDOMIZED CLINICAL TRIAL
S. A. Gandolfi, L. Quaranta, N. Garattini, C. Sangamaneri, M. G. Tartini, S. Bettelli
University Eye Clinic Parma, Italy

Purpose: To compare the long-term outcomes of trabeculectomy versus deep sclerectomy.

Methods: Prospective, two-center randomized investigator-masked clinical trial. Eligibility: age > 65 yrs, open angle, IOP > 22 and < 30 mmHg, at least one eye with previous laser trabeculoplasty, topical beta blocker in fellow eye. Mean age = 67+12 (24/2 Humphrey full field thresholds). Seventy nine eyes (79 patients) enrolled and randomised by pseudoexfoliation and used topical microwave deep sclerectomy and with or without collagen implant and trabeculoclysis (Group B, n=37). Main efficacy outcome: % of eyes showing a IOP < 16, 18 or 21 mmHg without medications at the end of follow up. Secondary outcomes (a) changes in visual acuity (LogMAR), (b) % of enrolled patients with improvement of at least 5 ETDRS lines. Statistical analysis was performed on an ‘intent-to-treat’ basis. Power > 90%, alpha probability > 0.05.

Results: Two eyes in Group A and one eye in Group B showed a complete failure (i.e. IOP > 20 mmHg unresponsive to medication + or − β-blockers), and in one of these cases the IOP was 21 mmHg in either eye with or without previous trabeculectomy or laser interventions. Further glaucoma surgery was performed in 8 DS in 2 TE.

Conclusions: (a) trabeculectomy offered a better IOP control than deep sclerectomy seven years after surgery; (b) when deep sclerectomy was converted to a penetrating procedure by means of post-operative Yag-laser gonipuncture, the success rate increased significantly (deep sclerectomy was associated with a lower incidence of cataract extraction.

Dr. Umran Mabrouk, 4.22

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to within two lines of preoperative levels and remained stable in all patients beyond three weeks.

**Conclusion**

Postoperative IOP was not the same as that following a trabeculectomy with mitomycin C.

### References


### P309 PRIMARY CONGENITAL GLAUCOMA: RESULTS WITH TRABECULECTOMY WITHOUT MITOMYCINE, AND COMBINED TRABECULOTOMY AND TRABECULECTOMY PROCEDURES.

B. Batana, I. Yalav, B. Eksioglu, I. Erozan, S. Dulkus

**Introduction**

Glaucoma is a major cause of blindness in children, accounting for 2.5% to 10% of all registered blind children. Approximately 80% of patients with primary congenital glaucoma are operated on during the first year of life. The main aim of surgery is to control aqueous outflow and to prevent further visual deterioration.

**Methods**

The results of our study were presented in an abstract as a poster presentation.

**Results**

A significant difference was seen between the procedures of patients by Kaplan-Meier survival analysis.

**Conclusion**

We conclude that the surgical procedures are significant for limited age group and type of glaucoma without any associated eye or systemic disease.

### References


### P310 EFFICACY OF COMBINED TRABECULOPLASTY WITH DEEP SCLERECTOMY AND S-NUSOTOMY.

N. Nambo, M. Kusaka, M. Koyama, A. Ando, H. Terauchi, M. Matsushita

**Introduction**

Trabeculoplasty belongs to the group of invasive procedures. A difference was seen in the efficacy of combined trabeculoplasty and trabeculectomy for developmental glaucoma. The study compared the results of such combined procedures with the results of trabeculectomy alone.

**Methods**

Forty patients (22 boys and 18 girls, aged from 2 months to 18 years) were divided into two groups. Group I (15 patients) received trabeculoplasty first, followed by trabeculectomy. Group II (25 patients) received trabeculectomy first, followed by trabeculoplasty. The follow-up period was 3 months to 3 years.

**Results**

A significant difference was seen between the groups of patients by Kaplan-Meier survival analysis.

**Conclusion**

The combined surgical procedures were successful in a large number of patients with chronic congestive glaucoma. The procedure is a safe and effective method for the treatment of primary congenital glaucoma.
Introduction: Chronic angle-closure glaucoma is characterized by a permanent closure of the angle due to the annulation of the trabecular meshwork. Various mechanisms, such as relative pupillary block, plateau iris configuration, and phacomorphic angle closure may contribute. Persistent angle closure after peripheral iridectomy suggests a major contribution of the lens component.

Aim of the study: To report the outcome of primary phacoemulsification in patients with chronic angle-closure glaucoma (CAG) and primary open angle glaucoma (POAG) following extracapsular cataract extraction (ECE) for 3 years.


Design: Prospective, postoperative questionnaire study.

Methods: Sixty consecutive patients aged 30-80 years scheduled for first time phaco-trab surgery were more frequently interviewed in the presence of anterior intra-operative experience and their reaction to the visual experience between 30 minutes and four hours after the surgery.

Results: Forty-four patients (73.3%) reported perception of light. One or more colors were reportedly seen by 29 patients (48.3%) patients. A large proportion of the 39 patients (65%) also reported seeing colors, light brightness and instances of no light reportedly seen by 29 patients (48.33%) patients. A large proportion of the 39 patients (65%) reportedly saw flashes (Odds Ratio: 3.67, 95% CI 1.175 to 11.442).

Conclusions: Phaco-trab patients operated under peribulbar anesthesia reported lesser sensation of lights and more sensation of movements than cataract surgery patients. However, phaco-trab patients are less sensitive to intraoperative experience compared to phacoemulsification surgery. www.globalaigs.org

P313 COMPARISON OF SINGLE SITE VERSUS TWO SITE PHACOTRABECULECTOMY

U. Yadava

Maulana Azad Medical College and Allied - New Delhi, India

Introduction: Combining trabeculectomy with cataract surgery is aimed at minimizing the chance of post-operative pressure (IOP) rise in patients with glaucoma by reducing the chances of post-operative rise of intraocular pressure (IOP) in susceptible individuals. How- ever the technique of combining trabeculectomy with phacoemulsification varies with each surgeon. A good number of surgeons still prefer to do an extra capsular cataract extraction with trabeculectomy to avoid the uncertainty of results of phaco-trabeculectomy. Controversy prevails over different techniques and results of phaco-trabectomies and hence the need to es- tablish a standard and reliable method.

Aim of the study: To compare the results of temporal clear corneal phacoemulsification with superior trabeculectomy (two site) versus single site scleral tunnel filtration surgery.

Methods: Sixteen patients of cataract and primary open angle glaucoma with IOP ranging from 22 to 28mmHg (without previous glaucoma medication) posted for combined surgery were all-located to Group 1 i.e. single site scleral tunnel phaco-trabeculectomy, and Group 2 i.e. tem- poral clear corneal phacoemulsification with superior trabeculectomy, on alternate basis. Surgical details were outlined. IOP measurements were repeated till the end of four weeks to assess the control.

Results: Mean IOP was recorded as 26mmHg post-operatively in Group 1, while the post-opera- tive IOP was 17.12mmHg in Group 2. In Group 1 IOP was controlled in 82% cases while in Group 2 IOP was controlled in 77.1% cases. No major complications were seen in either group. Post-opera- tive survival rates for IOP control were 96.9%, 71.1%, 68.8% at I, 2, 12 months respectively.

Conclusions: IOP control was significantly better in Group 2 than in Group 1. However post-opera- tive survival rates were not significantly different. Post-opera- tive survival rates were not significantly different. Post-opera- tive survival rates were not significantly different. Post-opera- tive survival rates were not significantly different.

Design: Retrospective, noncomparable, interventional case series.

Participants: Study was conducted in patients who underwent phacoemulsification with intracocular lens implantation in an eye in a filtering bleb at least 6 months after trabeculectomy.

Methods: Preoperative, intraoperative and postoperative factors were evaluated for association with IOP control failure requiring additional medication or further glaucoma surgical procedure, using Kaplan-Meier survival plot and Cox proportional hazards regression analysis.

Main outcome measures: IOP, number of glaucoma medications and morphologic grade of filtering bleb before phacoemulsification and at various postoperative follow-up intervals.

Results: After mean postoperative follow-up of 13 ± 3 months, mean IOP increased from 12.1 ± 4.3 mmHg preoperatively to 14.7 ± 8.8, 13.6 ± 8.3 mmHg at 1, 12 months postoperatively (p = 0.003). Mean number of IOP medications was 1.3 ± 1.1 preoperatively and 1.5 ± 1.0 postoperatively (p = 0.202). Significant factors associated with IOP control failure were: active smoking (p = 0.031), previous trabeculectomy, past failure of filtering bleb (p = 0.004) and intraocular pressure at least 20 mmHg over prior therapy (p = 0.006).

Conclusions: Filtering bleb before phacoemulsification may be safe surgery for maintaining IOP control, especially if preoperative IOP is well-controlled and posterior capsule is prevented during operation.

References:
with or without medication. For the criterion IOP < 18 mmHg without therapy but more potentially sight-threatening complications and secondary interventions. Regarding IOP values <21 mmHg there was no significant difference between groups. For the majority of patients had a statistically significantly higher frequency of postoperative hypotony (9% vs. 35%; p<0.001). In group 1, hyphema occurred statistically significantly more frequently (26% vs. 7%, p=0.005), whereas group 2 had a statistically significantly higher frequency of postoperative hypotony (9% vs. 35%, p<0.001). In group 1, hyphema occurred statistically significantly more frequently (26% vs. 7%, p=0.005), whereas group 2 had a statistically significantly higher frequency of postoperative hypotony (9% vs. 35%, p<0.001). In group 1, hyphema occurred statistically significantly more frequently (26% vs. 7%, p=0.005), whereas group 2 had a statistically significantly higher frequency of postoperative hypotony (9% vs. 35%, p<0.001).

Conclusion: The non penetrative deep sclerectomy with MMC and SK-Gel implant associated with phacoemulsification is a safe and effective treatment for advanced glaucoma associated with cataract.

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4. McDonald: Compliance with the ocular medications by the glaucoma patients has been very poor. The main reasons for this were because of the need of frequent visits to the clinic and at home. In the last years we have observed a significant noncompliance rate and this is very common in patients with visual impairments. The reasons for noncompliance may be:

A. Patients' reasons:
1. Missed appointments
2. Failure to take medications correctly
3. Taking medications for wrong reasons
4. Frequent changes in the medications

B. Doctors reasons:
1. Lack of training
2. Lack of patient education
3. Lack of follow-up
4. Lack of monitoring

Conclusion: The non penetrative deep sclerectomy with MMC and SK-Gel implant associated with phacoemulsification is a safe and effective treatment for advanced glaucoma associated with cataract.

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Conclusion: The non penetrative deep sclerectomy with MMC and SK-Gel implant associated with phacoemulsification is a safe and effective treatment for advanced glaucoma associated with cataract.

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Results: The annual direct treatment cost ranged from EUR 429 to EUR 523. Rehabilitation costs contributed 6% to total costs due to the great variability between different European countries. However, estimates of rehabilitation costs ranged from EUR 3.859 to EUR 8.445. Patient costs ranged from EUR 7.436 to EUR 10.200 including some one-off costs. No correlation between economic and clinical efficacy was observed. Ten studies reported comparable time-trade-off QOL scores (TTO). The average QOL scores decreased with increasing visual impairment (p=0.01).

Conclusion: The review and analysis shows that visual impairment and blindness has an impact on the European societies in terms of treatment, rehabilitation and patient costs and patient QOL. However, no substantial information on QOL or costs of going blind from glaucoma was found. Thus, further research is required.

Selected references:
5. X. Chen 1, Y. Liu 2, M. Li 2, N. Li 2

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P237 MEDICAL CARE COSTS OF PRIMARY OPEN-ANGLE GLAUCOMA IN THE UNITED STATES: A NATIONAL ESTIMATE USING THE MEDICAL EXPENDITURE PANEL SURVEY

G.F. Schwartz*, M.A. Mychaskiw*

*Glaucoma Consultants, Baltimore, MD, United States of America. **Pfizer, Inc., New York, NY, United States of America. **Institute on the Economics of Aging, Medical University of South Carolina, Charleston, SC, United States of America.

Purpose: The aim of this study was to estimate the direct costs of medical care associated with the treatment of primary open-angle glaucoma (POAG) in the United States.

Design: Retrospective analysis of the 2001 Medical Expenditure Panel Survey (MEPS) data.

Participants: The MEPS cohort included individuals aged 40 years and older who were enrolled in private insurance. A sample of 33,556 respondents was selected from a representative sample of 33,556 respondents and from respondents’ health care and insurance arrangements.

Methods: Data extracted for this study included demographics (patients >40 years of age), medical conditions, and utilization of and payments for medical care. Patients with POAG were identified from the patient’s self-report of the diagnosis using ICD-9-CM codes (365.4). Total direct costs were calculated using patient and third-party payments for POAG-related medical events by type of care provided (office-based provider visits, prescription medications, and outpatient services). Sample estimates were weighted and proportioned to the population and 95% confidence limits were calculated using the Taylor expansion method.

Main outcome measures: Estimated prevalence and total direct costs of POAG in the United States.

Results: The estimated prevalence of POAG was the 1.25% (95% CI:0.94–1.56%) or 1,640,077 individuals. Total direct costs of POAG were $1,788,914,417 with an average cost of $1,091 per patient. Prescription medications accounted for $1,042,509,011 (mean cost / prescription: $58, 95% CI: $50–60) or 60% of direct costs. Direct-based under visits represented $619,401,436 (mean cost / visit: $105, 95% CI: $56–$113) and outpatient services represented $127,003,970 (mean cost / patient: $316; 95% CI: $308–$344).

Conclusion: POAG was estimated to be 1.7 million individuals with resultant medical care costs approaching $2 billion. Although prescription medications accounted for 58% of total direct costs, they had the lowest mean cost across the types of care. It will be that innovative drugs and therapies are preferable to less effective alternatives to contribute to less utilization of more costly medical care.

References:

15. MISCELLANEOUS

P238 THE PATTERN AND SEVERITY OF BOTH TYPES OF PRIMARY GLAUCOMA IN QATAR P. Al Manourst

Hamad Medical Corporation, Doha, Qatar

Purpose: To describe the pattern and severity of both types of primary glaucoma in Qatari adult patients and to outline the main problems related to their management.

Material and methods: A random sample of 526 Qatari patients with primary glaucoma, either open angle (POAG) or angle closure glaucoma (ACG) was studied by standard questionnaire as regards their personal and medical profile, and assessed ophthalmologically both subjectively and objectively.

Results: Over 2/3 of the random sample of patients were POAG (70.8%). POAG affected patients at an early stage (before 40 years) in 23.4% compared to ACO (10.7%) and in severe forms (38.6%) respectively. The positive family history the most important risk factor (34.5%) with progressive glaucomatous optic neuropathy occurring in 36.7% and poor compliance in 46.5%.

Conclusion: Glaucoma in Qatari patients presents at an early age, with substantial loss of visual function at presentation. Poor compliance is an obstacle for management in both types of glaucoma. The need for an efficient campaign and a program for early detection and treatment is highly recommended.

P239 AN INVESTIGATION FOR THE EVENTS THAT LED TO THE DIAGNOSIS OF GLAUCOMA IN SICHUAN, CHINA X. Chen, Y. Liu, M. Li, N. Li

West China Hospital, Chengdu, China. West China Eye Center, Chengdu, China

Purpose: To determine the triggers that referred patients to hospital, so that glaucoma was identified in Sichuan, China.

Design: Retrospective, consecutive, non-comparative case series.

Participants: 878 consecutive primary glaucoma patients who visited West China Eye Center in 2004.

Methods: A questionnaire included in which hospital the patient was diagnosed initially, the reason that led the patient to hospital, the main ocular symptoms that patient complained, the pattern and abnormality of the visual fields, the risk factors that contributed to less utilization of more costly medical care.

Results: Decreased vision (87.7%), ocular pain (80.8%) and bulbary hypotonia (78.1%) were the most common events of acute angle-closure glaucoma patients who sought medical help. 39.7% of patients with chronic angle-closure glaucoma were identified. 25% of patients with open angle glaucoma had decreased visions. 25% of the patients who had no oculay symptom were diagnosed during routine examinations, or during examinations as having positive family history for glaucoma. Seventy-five of glaucoma patients (7.5%) were identified as having positive family history for the most significant risk factor (34.5%) with progressive glaucomatous optic neuropathy occurring in 36.7% and poor compliance in 46.5%.

Conclusion: Glaucoma in Sichuan patients presents at an early age, with substantial loss of visual function at presentation. Poor compliance is an obstacle for management in both types of glaucoma. The need for an efficient campaign and a program for early detection and treatment is highly recommended.

References:

Prostaglandin analogues, however, have an increasingly important role in the medical management of ocular hypertension and glaucoma therapy. The use of prostaglandin analogues latanoprost and bimatoprost have been shown to decrease IOP in POAG and OHT patients to a greater extent than beta blockers. Though their hypotensive effect seems to be similar during daytime, a day is required on the drug before efficacy and lowering effect and side effects. Nonetheless, conflicts have been recently reported in recent trials. We reviewed all published and abstracted studies on efficacy and safety of prostaglandin analogues in order to: a) perform a quantitative meta-analysis of RCTs’ results; b) compare data on the three drugs and obtain a summary estimate of their effects; c) try to solve controversies among results of existing trials and RCTs’ methodologies and IV RCTs comparing efficacy and side effects of prostaglandin analogues were collected (MEDLINE and EMBASE database, literature search). The quality of the RCTs was evaluated by two independent evaluators. Data about efficacy and side effects were collected. Calculation of ‘summary odds ratio’ with Mantel-Haenszel-Peto method for meta-analysis of proportions: incidence of systemic and ocular side effects. Calculation of the ‘effect size’ for decrease of 1% IOP. WMD (fixed), 2% mean (fixed effect). Review Manager 4.2 program was used for calculations. 114 RTCs on efficacy of prostaglandin analogues were found. Of these, seven studies were comparing bimatoprost with another prostaglandin analogue. The total sample size was 1,123 patients, mean 160 (range 31-411). Mean follow-up was 2.5 months (range 1-6). All Patients using latanoprost or bimatoprost were either new or in other proper w.o. IOP trials were comparing bimatoprost with latanoprost while 37 were comparing bimatoprost with travoprost. The pooled estimate from the 7 RCT’s indicated that bimatoprost was more effective in reducing IOP than the other PGAs: latanoprost (85.9% (95% C.I. 0.7-1.3)) and travoprost. The heterogeneity among studies’ results was significant. Bimatoprost was associated with an increased risk of ocular side effects, with a summary OR + 2.85 (95% C.I. 1.3-6.9). When only severe side effects were considered, the OR was 25.2 (95% C.I. 0.7-1.3). These results indicate that the use of PGAs among prostaglandin analogues was not significant (OR=1.48, 95%C.I. 0.6-2.3). In conclusion, bimatoprost was found to be more effective in reducing IOP, though its use was associated with an increased incidence of ocular side effects.

P331 USING THE STARD CRITERIA TO ASSESS THE QUALITY OF DIAGNOSTIC ACCURACY STUDIES OF OCT IN GLAUCOMA
Z.K. Johnson, A. Jauza-Albanzo
Alfred Hospital, Royal Melbourne, Australia

Introduction: Optical Coherence Tomography (OCT) has been proposed as a useful tool for the diagnosis of glaucoma. If diagnostic studies are not conducted or reported properly, interpretation of their results in terms of clinical applicability is then difficult. The STARD (Standards for Reporting of Diagnostic Accuracy) initiative. Ann Intern Med 2003; 138: 40-45.


P335 BILATERAL PERSISTENT HYPERPLASTIC PRIMARY VITREOUS WITH BUPHTHALMOIDOS. A CASE REPORT
S. Gupta 1, S. Goyal 2, R.K. Bansal 3
1 G.M.C.H. Chandigarh, India, 2 G.M.C.H. Chandigarh, India, 3 G.M.C.H. Chandigarh, India
Introduction: Persistent Hyperplastic Primary Vitreous (PHPV) can have wide clinical presentations. Most cases tend to be unilateral though review of various cases from the literature shows it to be present in both eyes in 11% of cases. 1. The cases that present bilaterally have associated systemic anomaly and die at a younger age. Our patient has no systemic abnormality; a similar case of bilateral PHPV without any systemic disease has been reported earlier. 2. Buphthalmos due to secondary glaucoma is an important late presentation of PHPV and has been reported in 26% of the cases. 3. One eye of our patient had buphthalmos with IOP of 19.4mmHg. Glaucoma in PHPV could result from recurrent vitreous hemorrhage, which is the most likely mechanism in our case.3. Aim of the study: To present as poster a rare case of bilateral PHPV with buphthalmos in one eye.
Method: A five-month-old male infant was seen in out patient with history of bilateral leukoeuoria since the age of four months.
Results: Examination of eyes under general anesthesia showed: Right eye corneal diameter of 14mm in horizontal and 13.5mm in vertical meridian. Anterior chamber was shallow. Iris showed blood vessels going from iris to the lens surface with ectropion uvea. The lens was clear. There was no view of the fundus other than a red glow from dense vitreous hemorrhage. Intraocular pressure was 14.9mmHg with Schiøtz tonometer. Left eye: Corneal diameter was 9.5 mm in horizontal and vertical meridian. Anterior chamber was normal. Lens was clear. There was a fibrovascular membrane on the posterior surface of the lens obscuring the fundus view. Intraocular pressure was 14.9mmHg. B scan ultrasonography of the right eye was suggestive of vitreous hamartoma with a fibrous band from disc to posterior lens surface. Left eye scan showed a similar hyper-echoic shadow from disc to posterior lens surface suggestive of fibrous band from disc to posterior lens surface. MRI scan on T1 image showed hyper intense echoes from vitreous cavity of right eye and central hyper intense echoes from disc area to the posterior lens surface in both eyes. Histopathology of the right eye showed dense fibro vascular band extending from disc to posterior surface of lens confirming diagnosis of PHPV. The left eye underwent pars plana lensectomy with vitrectomy. After lensectomy ciliary processes were seen to be dragged towards the center and retina was thrown into fixed folds and was incarcerated into the fibro vascular band. Conclusion: Bilateral PHPV is a rare disorder and sometimes can present as secondary glaucoma due to recurrent vitreous haemorrhage.
P336 SAETHRE-CHOTZEN SYNDROME HOW TO IMPLEMENT COMPLIANCE WHEN A DIFFICULT CLINICAL CASE.
M.A. Mousaali, A. Barnetto, J.C. Casiraghi
Hospital de Clínicas, Buenos Aires, Argentina
Introduction: To present a rare genetic syndrome which prevalence is 1:50,000. It is an inherited craniosynostotic condition with both premature fusion of cranial sutures (craniosostenosis) and limb abnormalities. The most common clinical features, present in more than a third of patients, consist of coronal synostosis, brachycephaly, low frontal hairline, facial asymmetry, hypertelorism, broad halluces, congenital disorder, deafness, depression, congenital heart defects, respiratory problems, mental disarrangement and clinopecty. The estimated birth incidence is 1:25,000 to 1:50,000 but because the phenotype can be very mild, the entity is likely to be underdiagnosed. SCS is inherited as an autosomal dominant trait with a high penetrance and variable expression. The TWIST gene located at chromosome 7p21- p22, is responsible. Regarding ocular findings, this syndrome causes orbito malformation, strabismus, ptosis, exophthealms, optical atrophy and corneal disorders. Up to now, this one would be the only case study associated with glaucoma. The difficulty to start up by a responsible diagnoses to set up the right treatment is shown. In order to achieve this, the following is needed: Understanding, Target intraocular pressure, Compliance, Tolerance, Effectiveness, Minimal ocular and systemic disorders.
Design: Description of a derived patient to Glaucoma Service. Semiological examination was made. Family medical history questionnaire with negative response. Ophthalmological routine test. Utrasound pachymetry, Octopus visual field, Tension curve, eye examination with gonio lens, refraction, micromicroscopy, optic disk examination with hofd lens.
Controls: Twenty-one-year-old male with Saethre-Chotzen syndrome. Facial dysmorphism, including ptosis, low frontal hairline, nasal deviation with high bridge, proptosis, angled ears, scoliosis and torticollis, clinopecty, large halluces, neurosensorial hypacusis, depression and difficulty in communicating. He came to us with a visual acuity of RE 20/25 and CYL-3 and LE 20/30 with CYL-3.5 at 160°; an ocular pressure elevated up to RE 29mmHg and LE 32mmHg. He also presented keratits and corneal ulcer.
Main outcome measures: This glaucoma was defined as congenital, retar and inherited; associated with chromosomal disorders. It is decided to treat the patient with latanoprost and artificial tears to improve the corneal state.
Results: The patient well tolerated the medication and understood treatment with good communication and compliance. The daily tension curve was RELE 20/22, 18/19, 17/17, 17/16, 21/23. According to the patients clinical situation and pachymetry, with a prior consign of the ophthalmologist, was decided to add Timolol with Latanoprost in the same formula. We obtained this new tension curve (with minimal dry eye and a follow-up of the patient): RELE 16/18, 14/15, 13/14, 14/14, 14/15.
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