

The International Congress of
**ADVANCED TECHNOLOGIES &
TREATMENTS FOR GLAUCOMA**
October 29-31, 2015

OCTOBER 29-31, 2015
POLITECNICO DI MILANO, MILAN, ITALY



PROGRAM

www.glaucomacongress.com



POLITECNICO
MILANO 1863

The International Congress of
**ADVANCED TECHNOLOGIES &
TREATMENTS FOR GLAUCOMA**
October 29-31, 2015

Disclaimer

Glaucoma Congress organizes the International Congress of Advanced Technologies and Treatments for Glaucoma (ICATTG) with the aim of providing education and scientific discourse in the field of glaucoma. Glaucoma Congress 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 contribute an endorsement by Glaucoma Congress.

Produced for Glaucoma Congress by Kugler Publications, Amsterdam, the Netherlands.
Typesetting: 3bergen.com

© 2015 Glaucoma Congress

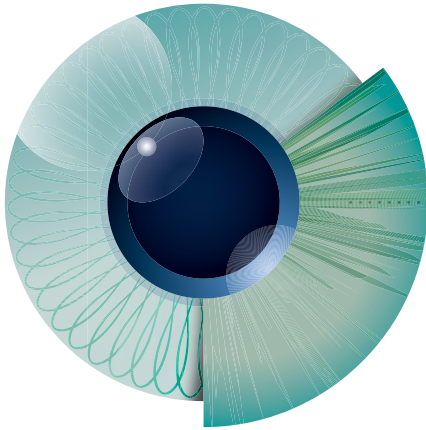
No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior consent of the copyright owners.

Program at a Glance

THURSDAY, OCTOBER 29	
12:30–17:30	Registration desk open
15:00–15:30	Opening Address
15:30–16:30	Keynote Lecture
16:30–17:30	Exhibition
FRIDAY, OCTOBER 30	
07:30–16:30	Registration desk open
08:45–10:15	Invited Paper Session: Glaucoma as a Two Pressure Disease
10:00–15:00	Exhibition
10:15–11:00	Coffee Break
11:00–12:30	Invited Paper Session: Multidisciplinary Approaches in Glaucoma
12:30–14:00	Lunch
14:00–15:45	Invited Paper Session: Glaucoma Imaging
SATURDAY, OCTOBER 31	
07:30–13:00	Registration desk open
08:30–10:15	Invited Paper Session: Novel Therapies and Personalized Medicine in Glaucoma
10:00–12:00	Exhibition
10:15–10:30	Coffee Break
10:30–11:30	Poster Sessions
11:30–12:30	Round Table
12:30–13:00	Closing Address

For complete program see page 18.

October 29–31, 2015, Politecnico di Milano, Milan, Italy • 3



JMO

Journal for
Modeling in
Ophthalmology

Journal for Modeling in Ophthalmology - Focus and Scope

While the rapid advance of imaging technologies in ophthalmology is making available a continually increasing number of data, the interpretation of such data is still very challenging and this hinders the advance in the understanding of ocular diseases and their treatment. Interdisciplinary approaches encompassing ophthalmology, physiology, mathematics and engineering have shown great capabilities in data analysis and interpretation for advancing basic and applied clinical sciences.

The Journal for Modeling in Ophthalmology (JMO) was created in 2014 with the aim of providing a forum for interdisciplinary approaches integrating mathematical and computational modeling techniques to address open problems in ophthalmology. JMO welcomes articles that use modeling techniques to investigate questions related to the anatomy, physiology and function of the eye in health and disease.

Chief Editors

Alon Harris
Giovanna Guidoboni

Managing Editor

Giovanna Guidoboni

Editorial Board

Makoto Araie, Fabio Benfenati, Richard J Braun, Thomas Ciulla, Jean-Frederic Gerbeau, Rafael Grytz, Michaël Girard, Gabor Holló, Ingrida Januleviciene, Jost Jonas, Larry Kagemann, Fabian Lerner, Anat Loewenstein, Toru Nakazawa, Colm O'Brien, Anna Pandolfi, Peter Pinsky, Rodolfo Repetto, Riccardo Sacco, Einar Stefansson, Fotis Topouzis, Zoran Vatauvuk, Joanna Wierzbowska

www.modeling-ophthalmology.com

Table of Contents

Program at a Glance	3
Welcome	7
Program Committee	8
General Meeting Info	10
• Venue	10
• Address Main Entrance	10
• Locations	11
• Politecnico di Milano	12
• Language	12
• Dress Code	12
• Registration Desk	13
• Registration Fees	13
• Cancellations/Refunds	13
• Badges	14
• Certificate of Attendance	14
• Poster Presentations	14
• Catering	15
• Lost And Found	15
• ICATTG Online	15
How To Get Around In Milan	17
Scientific Program	18
• Thursday, October 29	18
• Friday, October 30	19
• Saturday, October 31	21
Faculty Information & Program Abstracts	22
Poster Abstracts	43
Sponsors & Exhibitors	59



POLITECNICO
MILANO 1863

October 29–31, 2015, Politecnico di Milano, Milan, Italy • 5

NOW AVAILABLE - SAVE 10% !

Integrated Multidisciplinary Approaches in the Study and Care of the Human Eye



EDITED BY

**PAOLA CAUSIN
GIOVANNA GUIDOBONI
RICCARDO SACCO
ALON HARRIS**

ISBN 978-90-6299-241-6

Dec. 2015. x and 185 pages. Hardbound.

Many figures and photos. 16x24 cm

List price € 80.00 / US \$ 100.00*

Discount price: € 72.00 / US \$ 90.00*

* excl. 6% VAT (only applicable for EU customers) and shipping costs

The human eye offers the possibility to non-invasively observe and quantify many morphological and hemodynamical data in real time. The interpretation of these dynamic data, however, remains a challenging task.

Mathematical models provide quantitative representations of the biomechanics and fluid-dynamics of the eye and their relationship with systemic conditions providing a valuable investigative tool. While inevitably presenting complex mathematics, this volume is not intended solely for mathematicians, rather it facilitates a new and exciting interdisciplinary field and approach to eye disease.

Please use discount code **MA15** when ordering at www.kuglerpublications.com for a 10% discount.

Welcome

We are honored and proud to welcome you to the new congress: The International Congress of Advanced Technologies and Treatments for Glaucoma (ICATTG).

The first edition, of hopefully many, is held from October 29th until the 31st, 2015 at the Politecnico di Milano (Milan, Italy).

This innovative and unconventional congress includes presentations and discussions on the latest developments and scientific achievements in glaucoma research and clinical care.

Topics of interest span from basic science to therapeutics, surgery and novel diagnostic technologies.

The congress brings together, for the first time, experts from various disciplines, including ophthalmologists, physicians, mathematicians, physicists and engineers.

A unique trait of the congress is the open and personal atmosphere that will permeate presentations and panel discussions, thereby promoting the transfer of knowledge and fostering new collaborations across scientific fields. We will strive to encourage brainstorming as it may open the pathway to a multidisciplinary approach in the treatment of glaucoma which, in our views, holds the key to a better understanding of glaucoma pathogenesis, progression and treatment.

We strongly believe that your open-minded and curious participation to the congress will make this new initiative a true success.

We sincerely thank you for joining us in this exciting adventure!

Program Committee Chairs:

Professor Giovanna Guidoboni

Professor Alon Harris

October 29–31, 2015, Politecnico di Milano, Milan, Italy • 7

Program Committee

Congress Chairs:



Professor Giovanna Guidoboni

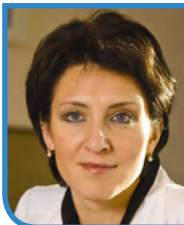
Associate Professor, Dept. Mathematical Sciences, IUPUI, Indianapolis, IN, USA;
Joint Chair between IUPUI (Indianapolis, IN, USA) and LabEx IRMIA (Strasbourg, France);
Gutenberg Chair, University of Strasbourg, France;
Adjunct Professor, Dept. Ophthalmology, IU School of Medicine, Indianapolis, IN, USA



Professor Alon Harris

Professor of Ophthalmology,
Professor of Cellular and Integrative Physiology,
Director of Clinical Research of the Eugene and Marilyn Glick Eye Institute, Department of Ophthalmology, IU School of Medicine, Indianapolis, IN, USA

Committee Members:



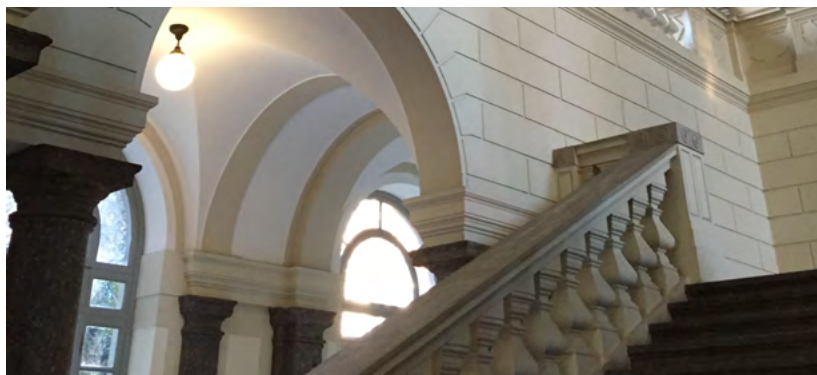
Professor Ingrida Januleviciene

Doctor of Biomedical Science,
Ophthalmologist,
Head of Outpatient Department,
Eye Clinic of Lithuanian University of Health Sciences
Hospital
Professor, Eye Clinic of Lithuanian University of
Health Sciences, Kaunas, Lithuania



Professor Riccardo Sacco

Associate Professor in Numerical Analysis,
Dipartimento di Matematica Politecnico di Milano,
Milan, Italy



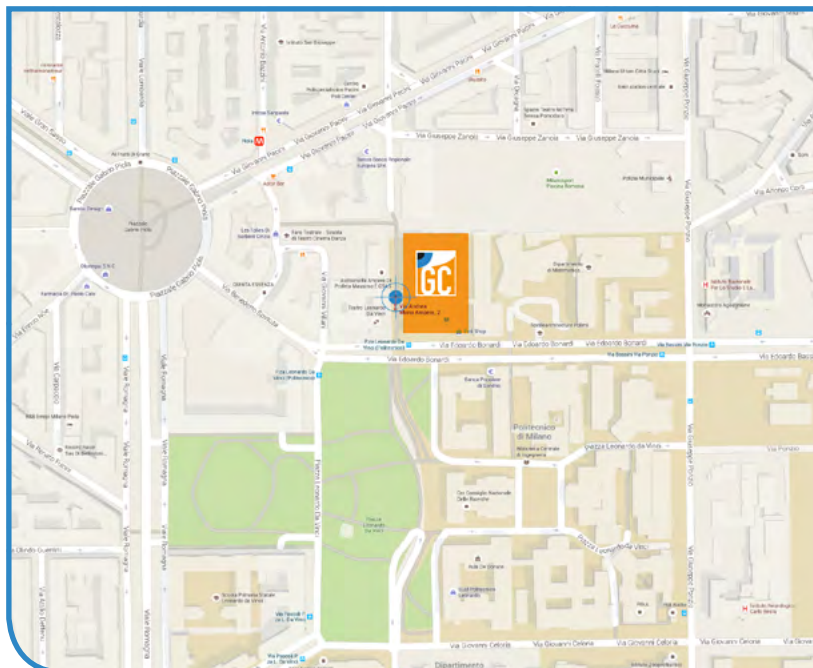
General Meeting Info



Venue

Politecnico di Milano—Aula Rogers

Address Main Entrance



Via Andrea Maria Ampère, 2
Milano, 20133 MI
Italy



POLITECNICO
MILANO 1863

Locations



Red line: Main entrance (Via Andrea Maria Ampère, 2, Milano, 20133 MI, Italy)

Green: Registration Area

Orange: Aula Rogers (all sessions are in this room)

Dark blue: Exhibition Area

Light Blue: Poster Area

Pink: Catering Area

October 29–31, 2015, Politecnico di Milano, Milan, Italy • 11

Politecnico di Milano

The Polytechnic University of Milan (Italian: Politecnico di Milano) is the largest technical university in Italy, with about 40,000 students. It offers undergraduate, graduate and higher education courses in engineering, architecture and design. Founded in 1863, it is the oldest university in Milan.



The Politecnico has two main campuses in Milan city, where the majority of the research and teaching activity are located, and other satellite campuses in five other cities across Lombardy and Emilia Romagna. The central offices and headquarters are located in the historical campus of Città Studi in Milan, which is also the largest, active since 1927.

The university was ranked the best for Engineering and among the top big universities in Italy in the CENSIS-Italian Republic University rankings for 2011–2012 and is ranked as the 28th best technical university in the world according to the QS World University Rankings.

Its notable alumni include Giulio Natta, Nobel laureate in chemistry in 1963.

For more information please visit: www.polimi.it/en



Language

The official language of the congress is English



Dress Code

The dress code for the congress is Casual.

Registration Desk

Opening hours

Thursday: 12:30–17:30
 Friday: 07:30–16:00
 Saturday: 07:30–13:00



Registration Fees

Resident Fee: € 250

The resident fee is intended for students, physicians and scientists in training.

Early Fee*: € 325

Regular Fee**: € 425

Onsite: € 550

**before or on September 30, 2015, **After September 30, 2015*



Cancellations/Refunds

In the event of cancellation, written notification must be sent by email to info@glaucomacongress.com.



The following refund conditions apply:

- In case of cancellation before or on August 1, 2015, the registration fee will be refunded with a deduction of 30% as penalty charge.
- In case of cancellation from September 10, 2015 to October 1, 2015, the registration fee will be refunded with a deduction of 70% as penalty charge.
- After October 1, 2015, the registration fee will not be refunded for cancellations or no-shows.
- For name changes an administrative fee of EUR 50 will be charged. For each name change you must notify the Congress registration office by e-mail to info@glaucomacongress.com before October 15, 2015. Name change participants agree to take over all booked program items of the originally registered participant.
- By registering to this event, you agree that your personal data will be processed by ICATTG and the Congress registration office, for registration and handling purposes, and to send you information in connection to ICATTG events. If you do not submit the data indicated as 'required', we cannot complete your registration. You have the right to access and rectify your personal data by contacting the registration office by email to info@glaucomacongress.com.



Badges

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

Name badges have been categorized as followed:

1. Faculty
 - a. Program committee
 - b. Speakers
2. Participants
3. Staff
4. Exhibitors



Certificate of Attendance

The Certificate of Attendance can be collected at the registration desk.



Poster Presentations

This highly interdisciplinary and interactive congress will create a forum to present and discuss the latest developments and scientific achievements in the field of glaucoma and will include: basic science; therapeutics; surgery and novel diagnostic technologies; genetics as well as mathematical modeling, image processing, statistical evaluation and prognostic aspects.

Submitted poster presentations have been reviewed by the scientific committee. Contributing presentations will sparkle scientific interactions among participants; and this is how new ideas are born! Please see page 43 for an overview of the different subject of the posters and the contributing authors.

All posters should be mounted on the poster boards by **Friday October 30th, 10.00am**. The size for a poster is **A1**, landscape oriented (594 mm x 841 mm, 23.5 in x 33.1 in).

Please refer to the poster number on the board and the one of your abstract to see where your poster should be mounted.

It's possible to print posters in the 'Polishop', located in the Politecnico di Milano: www.polishop.polimi.it

Poster viewing times

Posters can be viewed during the breaks. The official poster sessions is Saturday October 31st from 10.30–11.30am. Please make sure that at least one of the poster authors is present at the poster board during that time to present the work and to answer questions.



Catering

Coffee & tea will be provided in the Catering Area to all congress registrants during the breaks.



On Thursday evening there will be a Welcome Reception in the Catering Area and on Friday afternoon there is a lunch scheduled in the same area. Both are complimentary to all participants.

Please be informed that during the other congress days lunch will not be provided.

A number of bars with canteen facilities, where cold lunches and hot meals are served, are located both in Leonardo and Bovisa Campuses at Politecnico. Please see www.polinternational.polimi.it/life/living-polimi/students-restaurants/ for a detailed overview. There are several [restaurants](#) and [bars](#) in the surroundings for other lunch options.

Lost And Found

A lost and found is located at the registration desk.



ICATTG Online

WIFI

Important: In order to receive (complimentary) login credentials for the Politecnico WiFi network you will need to bring identification (passport) to the registration desk. These credentials are associated with your personal information: it is therefore in your best interest to keep them strictly confidential.



To access the internet, connect to the open wireless network named “polimi”; select “Login as a guest” from the list of authentication methods and enter your credentials (as printed on the sheet handed to you at the registration desk).

Instructions and terms of use are available at www.wifi.polimi.it/en and frequently asked questions can be found here: www.wifi.polimi.it/en/assistenza/



Social Media

#ICATTG15 will be the primary hashtag for all social media activity related to the ICATTG congress. Please follow @GlauCongress on twitter or keep an eye on our Facebook page (www.facebook.com/glaucomacongress) to follow the congress live.

Follow us on twitter



Follow us on Facebook



Website

Please make sure you check-out the congress website at www.glaucomacongress.com with the most current information.

www.glaucomacongress.com



Event recap

All sessions will be captured and made available free of charge to all participants after the congress.

How To Get Around In Milan

By Plane

Milan has two main international air gateways, [Linate airport](#) and [Malpensa airport](#). Sometimes referred to as Milan's additional airports, Bergamo's [Orio al Serio airport](#) (45km East) and [Parma airport](#) (100km South) mostly host budget airlines.



By Train—Central Railway Station

The main railway station is the Central Station ('[Milano Centrale](#)'), which is served by Trenitalia, the State Railways. Regular express and fast trains serve all Italian cities (Turin, Venice, Rome, Naples, Florence and many others), and some European cities (Barcelona, Zurich, Geneva, Munich, Paris, Stuttgart, Zagreb, Vienna, etc.).



Scientific Program

THURSDAY, OCTOBER 29

15:00–15:30 Opening Address

- Alon Harris, ICATTG Congress Chair
- Riccardo Sacco, ICATTG Committee Member
- Manuela Grecchi, Vice-Rector Politecnico di Milano
- Francesco Cappelli, Delegate of the Mayor of the City of Milano
- Piercesare Secchi, Head of the Department of Mathematics Politecnico di Milano
- Giancarlo Spinelli, Rector's Delegate for International Networks, Politecnico di Milano
- Giovanna Guidoboni, ICATTG Congress Chair

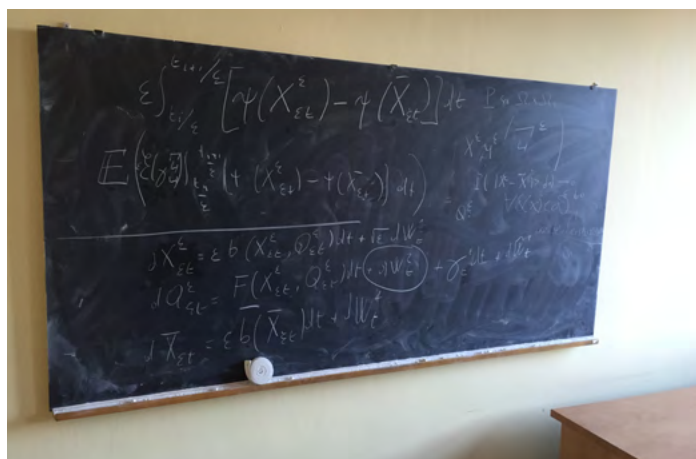
15:30–16:30 Keynote Lecture

NEW INSIGHTS INTO UNDERSTANDING RISK FACTORS IN GLAUCOMA: THE FUTURE

- Alon Harris



17:00–17:30 Welcome Reception



FRIDAY, OCTOBER 30

8:30–10:15 Invited Paper Session

GLAUCOMA AS A TWO PRESSURE DISEASE

Role of IOP, MAP, OPP, CSFp, ICP in glaucoma

- I. Januleviciene – 8:30–8:45

Non invasive ICP measurements

- A. Ragauskas – 8:45–9:00

A new noninvasive method, the Ocular Pressure Flow Analyzer, for measuring the ocular perfusion pressure and the ocular perfusion reserve in humans

- W.D. Ulrich – 9:00–9:15

Role of OPP in glaucoma: The importance of statistical methods

- A. Guglielmi – 9:15–9:30

Towards understanding the interplay between intraocular pressure and blood pressure: a mathematical model

- M. Szopos – 9:30–9:45

24-hour IOP fluctuation: Myth or reality?

- L. Quaranta – 9:45–10:00

Different IOP, different diseases?

- M. Iester – 10:00–10:15



10:15–11:00 Coffee Break

11:00–12:30 Invited Paper Session

MULTIDISCIPLINARY APPROACHES IN GLAUCOMA

Need for math modeling, from the clinical viewpoint

- A. Harris – 11:00–11:15

Computational and experimental methods for the biomechanics of living tissues

- M.L. Costantino – 11:15–11:30

Mathematical assessment of drug delivery to the posterior eye via transcleral route

- P. Causin – 11:30–11:45

Electro-fluid dynamics of aqueous humor production: simulations and new directions

- A. Mauri – 11:45–12:00

Role autoregulation in the perfusion of ocular tissues

- S. Cassani – 12:00–12:15

Mathematical Modeling active and passive response of retinal microvessels: an in silico insight to understand glaucoma

- F. Malgaroli – 12:15–12:30



12:30–14:00 Lunch Break

14:00–15:45 Invited Paper Session

GLAUCOMA IMAGING

Glaucoma imaging and glaucoma progression

- F. Meier-Gibbons – 14:00–14:15

Critical points that limit the diagnostic and follow up capabilities of the current imaging techniques

- R. Carassa – 14:15–14:30

High Performance Computing and Metamodeling: from medical image to real-time simulations

- C. Prud'homme – 14:30–14:45

Using corneal imaging to determine corneal properties and influence of IOP

- A. Pandolfi – 14:45–15:00

Computational models for fluid exchange between microcirculation and tissue interstitium. Applications to cerebrospinal flow and tumor microenvironment

- P. Zunino – 15:00–15:15

Optic disc imaging in daily practice

- S. Miglior – 15:15–15:30

Ocular blood flow parameters and structural progression in open angle glaucoma patients with different demographic characteristics

- K. Hutchins – 15:30–15:45

SATURDAY, OCTOBER 31

8:45–10:15 Invited Paper Session

NOVEL THERAPIES AND PERSONALIZED MEDICINE IN GLAUCOMA

Effect of HIFU cyclocoagulation in refractory glaucoma

- L. Rossetti – 8:45–9:00

Potent and selective antisense oligonucleotides targeting the TGF- β isoforms in advanced glaucoma: A preclinical perspective

- M. Janicot – 9:00–9:15

Mathematical model of hydraulic pressure in intraocular gas bubbles

- P.K. Jensen – 9:15–9:30

Interpreting retinal imaging and OCT

- E. Trucco – 9:30–9:45

Mathematical modeling to interpret oximetry data

- L. Carichino – 9:45–10:00

Patient-specific models of the human cornea

- I. Simonini – 10:00–10:15



10:15–10:30 Coffee Break

10:30–11:30 Poster Sessions

11:30–12:30 Round Table

Moderator: A. Harris

Panelists: G. Guidoboni, I. Januleviciene, R. Sacco

12:30–13:00 Closing Address

Alon Harris

Faculty Information & Program Abstracts



Roberto Carassa

Affiliation: Italian Glaucoma Center (Centro Italiano Glaucoma [CIG]), Milan, Italy

Country: Italy

Position: Associate Professor in Ophthalmology, Director of CIG

Research Interests: Glaucoma surgery (incisional and laser), development of international research protocols for glaucoma therapies.

Presentation

Critical points that limit the diagnostic and follow up capabilities of the current imaging techniques

Imaging techniques are commonly used in the clinical practice both for diagnosis and for follow-up of glaucoma patients. Nevertheless, imaging artefacts and software errors are quite common and can cause inappropriate clinical decisions. Physicians should be aware of the technological limits of each imaging technology and should always interpret the results in the context of all clinical data. An overview of the critical points affecting imaging results will be discussed.

When: Friday 14:15–14:30



Lucia Carichino

Affiliation: Indiana University Purdue University Indianapolis, Department of Mathematical Sciences, Indianapolis, IN, USA

Country: USA

Position: PhD student

Research Interests: Mathematical modeling of ocular blood flow. Partial differential equations and their applications to computational fluid dynamics and thermodynamics. Mathematical and computational modeling of solid structure deformations and fluid flow in deformable domains, including fluid-structure interactions.

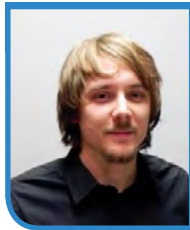
Presentation

Mathematical modeling to interpret oximetry data

Several clinical studies (*e.g.* Olafsdottir and Vanderwalle *et al.* 2014) have observed increased retinal venous oxygen saturation in glaucoma patients as compared with healthy persons. Here, a theoretical model is used to propose possible explanations for the clinically observed increases in saturation in advance glaucoma patients.

Further information available online

When: Saturday 9:45–10:00



Simone Cassani

Affiliation: Indiana University-Purdue University at Indianapolis (IUPUI), Indianapolis, IN, USA

Country: USA

Position: PhD student in Mathematics at IUPUI

Research Interests: Partial differential equations and their applications to computational fluid dynamics

and thermodynamics; Mathematical modelling of ocular blood flow; Numerical analysis; Turbulence models.

Presentation

Role autoregulation in the perfusion of ocular tissues

Alterations in retinal perfusion are associated with many ocular and systemic diseases such as glaucoma, age-related macular degeneration and diabetes. The retina is capable of autoregulation, which is the ability to adjust perfusion in response to alterations in tissue oxygen (O₂) demand, intraocular pressure (IOP) or blood pressure. Several different mechanisms work together to achieve autoregulation. Here, a mathematical model is used to investigate the relationship between retinal perfusion, tissue O₂ demand, IOP and blood pressure. Model simulations are used as a “virtual lab” in which the relative importance of various regulatory mechanisms is theoretically assessed in patients exhibiting different systemic conditions. The aim of the study is to investigate the contribution of vascular factors to the pathogenesis of ocular diseases on a patient-specific basis.

Further information available online

When: Friday 12:00–12:15



Paola Causin

Affiliation: Dept. of Mathematics, Università degli Studi di Milano, Milan, Italy

Country: Italy

Position: Assistant Professor

Research Interests: My research is devoted to the study of the numerical discretization of PDE problems

arising in medicine and biology.

Presentation

Mathematical assessment of drug delivery to the posterior eye via transcleral route

"I forgot to put my glaucoma drop in last night". This is a common experience for glaucoma patients. For most people, glaucoma is a chronic slowly progressive disease, and the patient sees no or little immediate benefit in daily administrations. Accompanied to the subjective perception, this sums to the fact that topical ocular medications often quantitatively show a poor dose/response profile, a great amount of the drug being washed away by tears. In this perspective, intravitreal injections and transscleral delivery are new emerging techniques with promising results, which allow a better patient compliance along with more sustained drug levels in the target areas. Much investigation is however still needed. Delivering drugs to the eye posterior segment, and especially to the retina, represents a significant challenge due to the eye restrictive barrier functionalities. Static barriers include tissues and limiting membranes, while dynamic barriers include drug clearance mechanism from blood and lymphatics. Purpose of this study was to develop a pharmacokinetics mathematical model to assess drug levels subsequent to a transscleral drug implant. The model comprises sclera, choroid, retina and vitreous along with the retina pigment epithelium at the choroid-retina boundary and the inner blood retinal barrier of the retinal vessels. Numerical solution of the model suggests that diffusion in tissue, clearance rates and membrane permeabilities play important roles in determining drug peak concentration and time-to-peak. However, their relative influence can be dramatically different depending on the rate-limiting parameter. The evaluation of the role of these parameters offers key points for the design of new drug delivery strategies for the posterior segment of the eye to offer better, improved treatment for glaucoma.

When: Friday 11:30–11:45



Maria Laura Costantino

Affiliation: Politecnico di Milano, Department of Chemistry, Materials and Chemical Engineering “Giulio Natta”, Milan, Italy

Country: Italy

Position: Full Professor

Research Interests: Life Support Systems Design, Design of Artificial Internal Organs, Biomechanics, Fluid Dynamics.

Presentation

Computational and experimental methods for the biomechanics of living tissues

When: Friday 11:15–11:30



Alessandra Guglielmi

Affiliation: Department of Mathematics, Politecnico di Milano, Milan, Italy

Country: Italy

Position: Associate Professor

Research Interests: My research interests focus on Bayesian statistical methods and models from

both theoretical and applied viewpoints. In particular, recent applied biostatistical work I have been involved in includes Bayesian nonparametric regression models for the association between SNPs and disease responses, for the prediction of the stochastic demand of home care patients, for the survival after infarction, and for the prediction of the next recurrent infectious event.

Presentation

Role of OPP in glaucoma: the importance (and correct understanding) of statistical regression models

Multiple logistic regression for the indicator of the disease (glaucoma) is a standard and powerful tool routinely used for investigating association among clinical variables. I will apply this class of models to a real dataset to illustrate the effects of collinearity of covariates as OPP, MAP, IOP and blood pressures, to increase awareness and understanding of these issues.

When: Friday 09:15–09:30



Giovanna Guidoboni

Affiliation: Dept. Mathematical Sciences, IUPUI, Indianapolis, IN, USA; LabEx IRMIA, Strasbourg, France; University of Strasbourg, France; Dept. Ophthalmology, IU School of Medicine, Indianapolis, IN, USA

Country: USA and France

Position: Associate professor, Chair Gutenberg

Research Interests: My area of research is Applied Mathematics and I am particularly interested in mathematical and computational modeling of complex fluid flows arising in engineering and bio-medical applications. Currently, I am focusing on an interdisciplinary project on the modeling of ocular blood flow. The goal of this project is to investigate the bio-mechanical connections between biomechanics, hemodynamics and metabolism in the eye, in order to gain a better understanding of the risk factors that may be responsible for various ocular diseases.



Alon Harris

Affiliation: Glick eye Institute, Indiana University Medical Center, Indianapolis, IN, USA

Country: USA

Position: Professor of Ophthalmology, Professor of Cellular and Integrative Physiology, Director Clinical Research, Glick eye Institute, Indiana University Medical Center

Research Interests: Ocular hemodynamics in metabolism in health and disease; Ocular blood flow and metabolism in eye disease progression; Non-invasive imaging assessment of ocular blood flow and metabolism; Relationship between ocular blood flow and visual function in glaucoma; Relationship between nerve fiber layer assessment and ocular blood flow in glaucoma; Vascular etiology of age-related macular degeneration; Vascular etiology of diabetic retinopathy; Medications that alter blood flow in age-related macular degeneration and glaucoma; Assessment of ocular metabolism in health and disease; Oximetry, the measurement of oxygen content in the human eye.

Presentation

Need for math modeling, from the clinical viewpoint

When: Friday 11:00–11:15



Katherine Hutchins

Affiliation: Department of Ophthalmology, Indiana University School of Medicine, Indianapolis, IN, USA

Country: USA

Position: medical student (2nd year)

Research Interests: Blood flow and glaucoma.

Presentation

Ocular blood flow parameters and structural progression in open angle glaucoma patients with different demographic characteristics

The aim of this study is to examine systemic blood pressure (BP), ocular perfusion pressure (PP), ocular blood flow, and structural disease progression in open angle glaucoma (OAG) patients of different diabetic status, gender, ethnicity, and body mass index (BMI).

When: Friday 15:30–15:45



Michele Iester

Affiliation: Laboratorio clinico anatomo-funzionale per la diagnosi e il trattamento del glaucoma e della malattie neurooftalmologiche, Clinica Oculistica, DiNOGMI, University of Genoa, Italy

Country: Italy

Position: Associate Professor in Ophthalmology

Research Interests: Glaucoma e neurooftalmologia; Imaging; Ocular blood flow; Perimetry; Treatment.

Presentation

Different IOP, different diseases?

Primary open angle glaucoma (POAG) patients could be easily divided into two subgroups based on the intraocular pressure (IOP) value. Some authors have noted optic disc and visual field differences between patients with high tension glaucoma (HTG) and normal tension glaucoma (NTG). In particular, the visual field damage in NTG was more likely to be dense, localized, and closer to fixation; while the optic disc appearance was characterized by larger optic discs, thinner infero-temporal rim areas, more pallor than cupping, and a pale, sloping, moth-eaten appearance.

Other authors believed that the appearance of the optic disc and visual field in patients with NTG was similar to that found in HTG.

The recent knowledge of the importance of cornea thickness in determining accurate IOP values, made unclear the boundary between the two diseases. Furthermore using these data it could be possible to understand how IOP values was not enough to separate different POAG subgroups. HTG could have POAG diagnosed because of a thick cornea, while NTG could be defined as POAG due to a thin cornea. However, it is not in this way and it is not completely understood its role in determining the real IOP values and glaucoma progression.

Many other risk factors are involved in the pathogenesis of glaucoma such as low blood pressure, migraines, repeated disc hemorrhages, gender, vasospastic phenomenon. Other studies have shown that glaucomatous patients could be divided on the basis of other risk factors instead of IOP showing interesting results, but, until now, IOP values are still the main parameter to classify HTG and NTG.

When: Friday 10:00–10:15



Michel Janicot

Affiliation: Isarna Therapeutics, Munich, Germany

Country: Germany

Position: Head of preclinical research & development

Research Interests: Preclinical and early clinical development of small molecules and biologics drug candidates for oncology intervention.

Presentation

Potent and selective antisense oligonucleotides targeting the TGF- β isoforms in advanced glaucoma: A preclinical perspective

When: Saturday 09:00–9:15



Ingrida Januleviciene

Affiliation: Eye Clinic of Lithuanian University of Health Sciences, Kaunas, Lithuania

Country: Lithuania

Position: Ophthalmologist, Head of Outpatient department

Research Interests: Role of intraocular, intracranial pressure and ocular hemodynamics in the pathogenesis of glaucoma

Presentation

Role of IOP, MAP, OPP, CSFp, ICP in glaucoma

Glaucoma is a progressive optic neuropathy characterized by irreversible damage to the optic nerve, causing permanent progressive loss of vision. The current knowledge about glaucoma is not sufficient to prevent or treat this blinding disease. It remains a disease with an unclear and complex underlying pathophysiology. Although intraocular pressure (IOP) is the main and only modifiable risk factor for glaucoma, vast number of patients still show signs of glaucoma despite an IOP within normal ranges. Systemic and localized vascular deficits, vascular autoregulation, ischemia, and metabolism have been shown to be involved in the disease process, especially in patients with normal IOP. Evidence shows that non-IOP factors may have impact on the apoptotic process associated with glaucoma.

When: Friday 08:30–08:45



Peter Koch Jensen

Affiliation: Eye Department, Roskilde Sygehus, Roskilde, Denmark

Country: Denmark

Position: Eye consultant

Presentation

Mathematical model of hydraulic pressure in intraocular gas bubbles

Intraocular gas after vitreo-retinal surgery may prevent travels with decreasing ambient pressure faster than trabecular outflow can

compensate the expanding gas bubble. Such an attack of acute glaucoma may result in a painful, blind eye even with risk of rupture. For counseling patients before an attempted travel, the present model was made to predict the time course of trans-scleral pressure (P) during alterations of ambient pressure.

The model predicts the time course of P during changes in ambient pressure (Fig 1). The most influential parameters are ranked: V, A, R, S, and E. For a large range of V identical pressure curves are obtained by linear combinations of E and R. Hence, V must be calculated from precise measurements of eye curvature (r) and height (h) by ultrasound. In the critical range for commercial aviation ($0.5 < V < 1$ ml or $6 < h < 8$ mm for $r=12$ mm) the best bubble approximation is obtained by an oblate ($V = \pi/3 h r h$).

When: Saturday 9:15–9:30



Francesca Malgaroli

Affiliation: Politecnico di Milano, Milan, Italy

Country: Italy

Position: PhD student

Research Interests: Mathematical modelling and simulation of blood flow and solute transport models in microcirculation. Application to transport of

dissolved and bound oxygen. Blood vessel mechanics. Computational Biology.

Presentation

Mathematical Modeling active and passive response of retinal microvessels: an in silico insight to understand glaucoma

The retinal circulation, due the small size of its vessels, shows the features of a microcirculatory system. The central retinal artery has a diameter of about 110 microns and branches progressively into arterioles and then in capillaries till a diameter of about 5 microns. A dual system of veins collects blood, terminating in the central retinal vein with a diameter of about 140 microns. The retinal vessels are situated in a pressurized environment (due to the intraocular pressure, IOP) that elicits a mechanic responses of the distensible vessel walls. Under low transmural pressure, vessels can buckle till reaching, essentially on the venous side, collapse. In addition, arteriole walls have a thick muscularis that give them the capability to actively constrict or dilate to regulate blood pressure

and flow under different stimuli. Vascular dysregulation –in terms of an impaired reaction to different stimuli- is present in at least some subgroups of patients with glaucoma. These mechanisms are yet not well understood, whilst their understanding might have some important therapeutic consequences on many individuals who do not benefit from traditional IOP lowering medications.

Further information available online

When: Friday 12:15–12:30



Aurelio Giancarlo Mauri

Affiliation: Dipartimento di Matematica Politecnico di Milano, Milano, Italy

Country: Italy

Position: Researcher

Research Interests: The numerical approach to the simulations of highly coupled electro-thermal-chemical-fluid systems using both finite element methodology and atomistic approaches; ion electro-diffusion in biological channels for electronics, the modeling of the operations of advance non-volatile memories, the tunneling in dielectrics media and the fluctuation phenomena.

ical-fluid systems using both finite element methodology and atomistic approaches; ion electro-diffusion in biological channels for electronics, the modeling of the operations of advance non-volatile memories, the tunneling in dielectrics media and the fluctuation phenomena.

Presentation

Electro-fluid dynamics of aqueous humor production: simulations and new directions

Intraocular pressure (IOP) is a recognized risk factor for vision loss and the balance between production and drainage of aqueous humor (AH) is responsible of the IOP steady state value. In this communication, we propose a physical-based mathematical model to approach at the level of Epithelial Cellular Scale (ECS) the description of the active secretion of AH across the (non-pigmented) epithelial (NPE) cells of the ciliary body. The model adopts the continuum approximation and employs Partial Differential Equations (PDE) to describe water efflux across the $\text{Na}^+\text{-K}^+$ ionic channel exchangers embedded in the NPE cells. In particular, the mathematical representation includes the velocity-extended Poisson-Nernst-Planck (vPNP) PDE system for ion electro diffusion in tandem with the Stokes (St) PDE system for AH secretion. The finite element numerical approximation of the vPNP-St model system is carried out using the flexible MP-FEMOS platform in a realistic 3D ion channel structure with

cylindrical shape considering the presence of K^+ , Na^+ , Cl and HCO_3^- ions. Preliminary results demonstrate a good agreement of model computed membrane voltage with experimental data and predict that under proper functioning of the Na^+-K^+ ion pump, a consequent AH efflux is elicited from the NPE cell into the adjoining basolateral space, in agreement with the biophysical model of Kiel *et al.*

Further information available online

Acknowledgements

This is a joint work in collaboration with S. Cassani, G. Guidoboni, C. Prud'homme, R. Sacco, M. Szopos and A. Harris.

When: Friday 11:45–12:00



Frances Meier-Gibbons

Affiliation: founding member of the Swiss Glaucoma Group

Country: Switzerland

Position: glaucoma specialist

Research Interests: special interest medical glaucoma therapy, diagnostics, glaucoma progression, ocular surface.

Presentation

The role of imaging in modern glaucoma management

In the last years, the imaging devices used in the glaucoma management changed tremendously: First we used conventional color photography of the optic nerve head, then computerized images (HRT) and now different versions of the Optical Coherence Tomographies (OCT). Are they all clinically relevant? The clinical role of the different devices is critically examined and practical advice for the use of these examination methods is discussed.

When: Friday 14:00–14:15



find us on twitter:

@GlauCongress and #ICATTG15



Stefano Miglior

Affiliation: School of medicine and surgery,
Universita` degli Studi di Milano-Bicocca, Monza, Italy

Country: Italy

Position: Full Professor in Ophthalmology, Director of the
Ophthalmology Clinic, Policlinico di Monza, Monza, Italy

Research Interests: Diagnosis, medical treatment and
surgery of glaucoma, surgery correction of cataract and myopia, surgery
correction of lacrimal ways and palpebrals.

Presentation

Optic disc imaging in daily practice

Imaging of optic disc and of RNFL is gaining progressive popularity in daily clinical practice, given the burden of research in the field and the constant improvement of imaging technologies and devices. The implementation of OCT in almost all of the Ophthalmological Departments and in Private Offices has clearly facilitated its use in the diagnostic of glaucoma. OCT, HRT and GDx have been proven to have a high diagnostic ability in detecting normal from glaucomatous eyes, but they have not yet been shown to have the same degree of diagnostic ability in detecting true progression of the disease.

Aim of the presentation will be to show how the results obtained by these imaging devices should be interpreted in daily practice by the clinician, in order to improve the management of the glaucomatous patient or of the patient at risk for developing glaucoma.

Further information available online

When: Saturday 08:45–09:00

For more information:
www.glaucomacongress.com



Anna Pandolfi

Affiliation: Dipartimento di Ingegneria Civile e Ambientale, Politecnico di Milano, Milan, Italy

Country: Italy

Position: Associate Professor in Structural Mechanics, Politecnico di Milano, Italy; Visiting Associate in Aerospace at Caltech, Pasadena, CA, USA

Research Interests: Computational Mechanics; Material Modeling; Biomechanics.

Presentation

Using corneal imaging to determine corneal properties and influence of IOP

The air puff is a dynamic contactless tonometer test used in ophthalmology clinical practice to assess the biomechanical properties of the human cornea and the intraocular pressure due to the filling fluids of the eye. The test is controversial, since the dynamic response of the cornea is governed by the interaction of several factors which cannot be discerned within a single measurement. In this study we describe a numerical model of the air puff tests, and perform a parametric analysis on the major action parameters (jet pressure and intraocular pressure) to assess their relevance on the mechanical response of a patient-specific cornea. The particular cornea considered here has been treated with laser reprofiling to correct myopia, and the parametric study has been conducted on both the preoperative and postoperative geometries. The material properties of the cornea have been obtained by means of an identification procedure that compares the static biomechanical response of preoperative and postoperative corneas under the physiological IOP. The parametric study on the intraocular pressure suggests that the displacement of the cornea's apex can be a reliable indicator for tonometry, and the one on the air jet pressure predicts the outcomes of two or more distinct measurements on the same cornea, which can be used in inverse procedures to estimate the material properties of the tissue.

Acknowledgements:

The work has been developed in collaboration with Irene Simonini, Politecnico di Milano, and Maurizio Angelillo, University of Salerno.

When: Friday 14:45–15:00



Christophe Prud'homme

Affiliation: University of Strasbourg, Strasbourg, France

Country: France

Position: Professor at Institute of Advanced Research in Mathematics; Director of the Center for Modeling and Simulation in Strasbourg; Manager for the French

Agency for Mathematics in Interaction with Enterprises and Society

Research Interests: Biomedicine in particular the brain, the eye and their connections; modeling and simulation; high performance computing; reduced order modeling and methods.

Presentation

High Performance Computing and Metamodeling: from medical image to real-time simulations

In the last 20 years there have been lots of progress in 3D medical imaging (such as Magnetic Resonance Imaging, MRI, and X-ray Computed Tomography, CT) and in particular in modalities to visualise vascular structures. The resulting images have been successfully used in various clinical applications, in particular for cerebrovascular pathologies (e.g., neurosurgery planning; stenoses, aneurysm or thrombosis quantification; arterio-venous malformation detection and follow-up, etc.). The complexity of the processing and analysis of these images (size, information vs noise, artifacts, etc.) led to the development of imaging tools such as vessel filtering, segmentation and quantification. There is however, until now, no database of synthetic images and associated ground-truths (segmented data) available in cerebrovascular images contrary to morphological brain image analysis (e.g. brainweb).

In the ANR Vivabrain project, we combine the skills of several communities: computer science, applied mathematics, biophysics, and medicine to remedy the aforementioned observation. In particular we focus on complex multi-disciplinary problems such as (i) the handling of inter-individual cerebrovascular variability, (ii) the generation of computational meshes, (iv) the simulation of blood flows in the complete cerebrovascular system 3D+time (3D+t) including calibration and validation and (iv) the accurate simulation of the physical processes involved in MRA acquisition sequences in order to finally obtain realistic virtual angiographic images.

Further information available online

When: Friday 14:30–14:45



Luciano Quaranta

Affiliation: University of Brescia, Brescia, Italy

Country: Italy

Position: Associate Professor in Ophthalmology

Research Interests: Glaucoma, medical and surgical therapies, clinical studies.

Presentation

24-hour IOP fluctuation: Myth or reality?

The role of a diurnal tension curve is to assess IOP in relationship to either a risk factor for the development or progression of glaucoma or achievement of a target IOP which may direct a therapeutic change. Candidates for a diurnal curve are usually limited to glaucoma suspects to assess the risk for development of glaucoma or in patients with progressive glaucoma despite normal single office IOP measurements. Clinically diurnal IOP curves are used to determine the peak IOP and range. Most glaucoma specialists concur that IOP peaks tend to be associated with visual field decline, but there is little consensus as regards IOP fluctuation as a risk factor for progression of glaucoma.

Further information available online

When: Friday 9:45–10:00



Arminas Ragauskas

Affiliation: Professor of Kaunas University of Technology (KTU), Kaunas, Lithuania

Country: Lithuania

Position: Head of Health Telematics Science University at KTU

Research Interests: Creation, R&D and D&D of non-invasive technologies for diagnosing, physiological measurements and monitoring of the human intracranial media parameters and characteristics.

Presentation

Non invasive ICP measurements

To conduct a prospective validation study (accuracy, precision, sensitivity

and specificity) on TBI and SAH patients with invasive “gold standard” ICP sensors and simultaneously measuring non-invasive ICP based on ophthalmic artery blood flow parameters in the intracranial and extracranial segments of the artery with multidepth transcranial Doppler measurements.

Further information available online

When: Friday 08:45–09:00



Luca Rossetti

Affiliation: University of Milan; San Paolo Hospital, Milan, Italy

Country: Italy

Position: Director Eye Clinic University of Milan San Paolo Hospital; Associate Professor of Ophthalmology, University of Milan

Research Interests: Clinical research in glaucoma.

Presentation

Effect of HIFU cyclocoagulation in refractory glaucoma

HIFU technology has been successfully tried in the treatment of a number of pathologic conditions. Data from pilot studies indicate short-term IOP-lowering efficacy. Aim of the out study was to assess efficacy and safety of high-intensity focused ultrasound (HIFU) cyclocoagulation in decreasing IOP in refractory glaucoma.

Further information available online

When: Friday 8:45–9:00



Riccardo Sacco

Affiliation: Dipartimento di Matematica Politecnico di Milano, Milan, Italy

Country: Italy

Position: Associate Professor in Numerical Analysis

Research Interests: Multiscale/Multiphysics Models in Computational Biology, with special emphasis on:

multiscale microcirculation modeling of fluid flow and mass transport in the retina; coupled description of mass transfer and biomass growth in Regenerative Medicine; ion electrodiffusion phenomena in Cellular Biology and Bio-Hybrid Systems, including photoactivation of neuronal

retina cells based on organic polymers Layers and semiconductor-cell interfaces in Neuroelectronics. Computational models in semiconductor device simulation, including inorganic semiconductors for micro and nanoelectronics and organic polymers for solar cell design and technology. Mixed and Discontinuous Finite Elements for the Numerical Approximation of PDEs.



Irene Simonini

Affiliation: Dipartimento di Matematica, Politecnico di Milano, Milan, Italy

Country: Italy

Position: PhD student

Research Interests: Eye, cornea, numerical simulations, finite element, tonometry tests, patient-specific model

Presentation

Patient-specific models of the human cornea

The patient-specific model is used to perform quasi-static analyses of the corneas of five patients undergoing laser refractive surgery to treat myopia or astigmatism [1] and three patients affected by keratoconus or suspected keratoconus. Once the material properties have been identified, the analyses provided a wealth of numerical results, in terms of displacements, strains and stresses. Patient-specific numerical models of the cornea can provide accurate quantitative information on the refractive properties of the cornea under different levels of IOP and describe the change of the stress state of the cornea due to refractive surgery (PRK) and due to various pathologies.

Further information available online

When: Saturday 10:00–10:15



Marcela Szopos

Affiliation: University of Strasbourg, Strasbourg, France

Country: France

Position: Associate Professor, Mathematics, Institut de Recherche Mathématique, Avancée, Université de Strasbourg, France; Officer for Interdisciplinary

research programs, Center for Modeling and Simulation, Strasbourg, France

Research Interests: Applied Mathematics, with a special focus on developing mathematical and computational methods for analyzing blood flow in the cardiovascular system as a complex multi-physics and multi-scale phenomenon.

Presentation

Towards understanding the interplay between intraocular pressure and blood pressure: a mathematical model

Elevated intraocular pressure (IOP), clinically referred to as ocular hypertension (OHT), is a recognized risk factor for irreversible vision loss.

Moreover, clinical studies showed that alterations in blood pressure (BP) are often associated with many ocular diseases. Thus, the combined effect of IOP and BP should be taken into account when assessing disease risks and evaluating the outcomes of different treatments on a specific patient. For example, the outcomes of IOP-lowering medications used for the treatment of OHT are observed to vary significantly among individuals, even though the factors influencing such variability are not yet fully understood. Here we propose a mathematical model to theoretically investigate the relationship between IOP and BP, with the aim of evaluating their potential impact on the individual response to IOP-lowering medications.

Further information available online

When: Friday 09:30–09:45



Emanuele Trucco

Affiliation: School of Science and Engineering (Computing), University of Dundee, Dundee, UK

Country: UK

Position: NRP Chair of Computational Vision; Head of Discipline; Honorary Clinical Research, NHS Tayside

Research Interests: Multimodal retinal image analysis, retinal biomarkers for eye and systemic diseases,

VAMPIRE project, computer vision, machine learning

Presentation

Interpreting retinal imaging and OCT

The VAMPIRE project (Vessel Assessment and Measurement Platform for Images of the REtina) is an international initiative led by the Universities of Dundee and Edinburgh (UK) and developing a suite of automatic and semi-automatic tools to collect efficiently morphometric measurements of the retinal vasculature, as well as locate and quantify lesions. VAMPIRE software is increasingly used in studies on retinal biomarkers for dementia, cognitive performance, genetics, diabetes, and more. This talk will give an overview of VAMPIRE, its current projects and collaborations.

When: Saturday 09:30–09:45



Wulff Ulrich

Affiliation: Leipzig, Germany

Country: Germany

Position: Professor of Physiology and Professor of Ophthalmology

Presentation

Noninvasive measurement of ocular perfusion pressure (ppoc) with the Ocular Pressure Flow Analyzer (OPFA) in healthy subjects and in patients with glaucoma

After describing the disadvantages and problems of existing methods for determining ocular blood pressure (poc) a new noninvasive method, the Ocular Pressure Flow Analyzer (OPFA) will be demonstrated for measuring the ocular perfusion pressure (ppoc), the ocular perfusion reserve (OPR)

and the ocular pulse blood volume (PVoc) in humans. Results of healthy subjects and glaucoma patients will be presented.

Further information available online

When: Friday 09:00–09:15



Paolo Zunino

Affiliation: MOX, Department of mathematics, Politecnico di Milano, Milan, Italy

Country: Italy

Position: MOX, Department of mathematics, Politecnico di Milano, Milan, Italy

Research Interests: multiscale analysis of flow and transport through networks

Presentation

Computational models for fluid exchange between microcirculation and tissue interstitium.

Applications to cerebrospinal flow and tumor microenvironment and cerebrospinal perfusion

This work aims at developing a computational model for the interplay between microcirculation and interstitial flow. Such phenomena are at the basis of the exchange of nutrients, wastes and pharmacological agents between the cardiovascular system and the organs.

When: Friday 15:00–15:15



OPFA



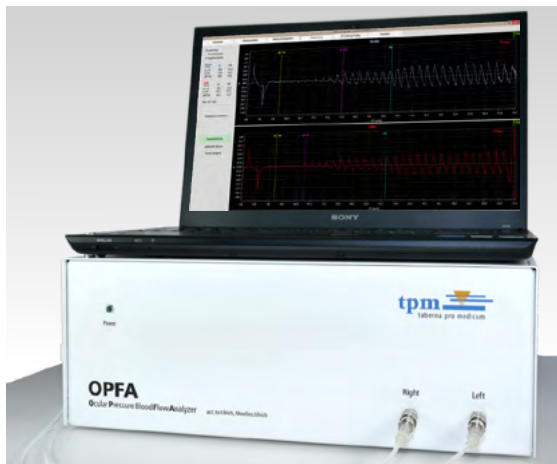
Ocular Pressure Blood Flow Analyzer

acc. to Ulrich, Moeller, Ulrich

A non-invasive diagnostic procedure to measure and record pulsatile ocular perfusion



Suction cups
acc. to Ulrich



- Early detection and management of primary open angle glaucoma (POAG) resulting from impaired autoregulation
- Early diagnosis and management of normal-tension glaucoma (NTG) resulting from reduced perfusion reserve
- Determination of ocular perfusion pressures, ocular arterial pressures and ocular pulse blood volumes as the basis of glaucoma diagnosis and treatment control
- Ocular perfusion in age-related macula degeneration and macular dystrophie
- Monitoring of ocular perfusion in diabetes and in diabetic retinopathies
- And many more, please find more information at www.tpm.eu

Developed and manufactured by:

tpm taberna pro medicum GmbH

street: Im Dorf 15a • ZIP/city: D-21335 Lueneburg • Tel.: +49-4131-401555
Fax: +49-4131-401755 • eMail: info@tpm-online.de • Web: www.tpm.eu

Poster Abstracts

P1 Comparison of Anterior Segment Parameters, Intraocular Pressure and Cataract Surgery Complications in Eyes With and Without Pseudoexfoliation Syndrome

Gaile Mazeikaite¹; Akvile Daveckaite¹; Lina Siaudvytyte¹; Loreta Kuzmiene¹; Ingrida Januleviciene¹

¹*Department of Ophthalmology, Lithuanian University of Health Sciences, Kaunas, Lithuania*

Background

The aim of this study was to compare preoperative intraocular pressure (IOP), A-scan ultrasound anterior segment parameters, intraoperative and early post-operative cataract surgery complications rate in eyes with and without pseudoexfoliation syndrome (PEX).

Methods

71 patients, scheduled for routine cataract phacoemulsification, were included in a prospective clinical study. Study eyes were grouped according to PEX existence: 29 eyes with PEX and 42 without PEX. PEX was defined by presence of any PEX deposits in at least one eye diagnosed by slit-lamp examination. Clinical features (visual acuity, IOP, slit lamp findings), pachymetry, ultrasonographic anterior chamber parameters and surgical complications were analyzed and compared between groups. The level of significance was $p < 0.05$.

Results

Before cataract surgery IOP was significantly higher in PEX group (16.91(2.33) mmHg) comparing to non-PEX group (15.23(2.08) mmHg), $p = 0.002$. Preoperatively best corrected visual acuity (BCVA) (0.26(0.21) in PEX group, 0.19(0.12) in non-PEX group, $p = 0.26$), central cornea thickness (CCT) (521.57(38.42) μm in PEX group and 526.36(36.11) μm in non-PEX group, $p = 0.235$), anterior chamber depth (ACD) (2.88(0.43) mm in PEX group and 2.89(0.42) mm in non-PEX group, $p = 0.871$) and lens thickness (LTh) (4.65(0.59) mm in PEX group and 4.59(0.44) mm in non-PEX group, $p = 0.583$) were not significantly different between groups. Intraoperatively

dilated pupil size was smaller in PEX group (6.58(0.99) mm and 7.52(1.04) mm in non-PEX group, $p=0.001$). Pupils smaller than 5 mm were found in 51.7% of the eyes (15 eyes) in PEX group and in 14.3% of the eyes (6 eyes) in non-PEX group, $p=0.001$. Zonular instability was noticed and capsular tension ring implantation was performed more frequently in PEX group (17.2% (5 patients) and 2.4% (1 patient) in non-PEX group, $p=0.027$). One day after surgery anterior chamber inflammatory reaction have occurred more frequently in PEX group (20.7% (6 patients) and 4.8% (2 patients) in non-PEX group, $p=0.037$).

Conclusion

Our results showed that preoperative IOP was higher in PEX group. CCT, ACD were smaller and BCVA, LTh were bigger in PEX group before cataract surgery though difference was not statistically significant. Poor pupil dilation, zonular instability intraoperatively and anterior segment inflammation postoperatively were noticed more common in PEX group, so the surgeon should be prepared to encounter the potential complications in the eyes with PEX undergoing cataract surgery. Further studies are needed to evaluate our preliminary findings of anterior segment parameters and IOP between PEX and non-PEX groups.

P2 Intracranial Pressure and Translaminar Pressure Difference in Normal-tension Glaucoma Patients with Different Glaucomatous Visual Field Defects

Lina Siaudvytyte¹; Ingrida Januleviciene¹; Akvile Daveckaite¹; Arminas Ragauskas²; Alon Harris³

¹Eye Clinic of Kaunas Medical Academy of Lithuanian University of Health Sciences, Kaunas, Lithuania; ²Health Telematics Science Centre of Kaunas University of Technology, Kaunas, Lithuania; ³Eugene and Marilyn Glick Eye Institute, Indiana University School of Medicine, Indianapolis, IN, USA

Background

The aim of the study was to assess differences in intracranial pressure (ICP) and translaminar pressure difference (TPD) in normal-tension glaucoma (NTG) patients with different glaucomatous visual field mean defects (MD).

Methods

58 NTG patients (17.2% male, 82.8% female) age 53.6(8.4) years were included in the prospective study. During the study intraocular pressure (IOP), non-invasive ICP, perimetry and confocal laser scanning tomography for optic nerve disc (OND) structural changes were assessed. Non-invasive ICP was measured using two-depth Transcranial Doppler device (Vittamed UAB, Kaunas, Lithuania. TPD was calculated as difference between IOP and ICP. NTG patients were divided into 3 sub-groups for comparison: 1) NTG patients with $MD < -3$ dB; 2) NTG patients with $-3 \geq MD < -6$ dB; 3) NTG patients with $MD \geq -6$ dB. The level of significance $p < 0.05$ was considered significant.

Results

NTG patients with $MD < -3$ dB had statistically significantly higher ICP (9.3(2.7) mmHg) compared to NTG patients with $-3 \geq MD < -6$ dB (7.2(2.3) mmHg) and NTG patients with $MD \geq -6$ dB (7.3(1.7) mmHg), $p = 0.01$. NTG patients with $MD < -6$ dB had significantly lower retinal nerve fiber layer thickness (RNFLT) 0.17(0.1) mm, compared to NTG patients with $MD < -3$ dB (0.23(0.1) mm, $p = 0.002$. There were no statistically significant differences in RNFLT between NTG patients with $-3 \geq MD < -6$ dB.

Conclusion

NTG patients with initial visual field defects had higher ICP and lower TPD compared to NTG patients with more pronounced visual field defects. Our findings suggest that there is a need for further longitudinal prospective studies investigating the role of ICP in NTG using non-invasive ICP measuring technology to more specifically elucidate the mechanisms by which ICP and TPD may influence NTG pathophysiology.



find us on facebook:
www.facebook.com/glaucomacongress

P3 Assessment and comparison of corneal sub-basal nerve plexus morphology and corneal sensitivity in type 1 diabetic and non-diabetic patients

Irmante Derkac¹; Ingrida Januleviciene¹; Kirwan Asselineau¹; Dzilda Velickiene¹

¹Lithuanian University of Health Sciences, Department of Eye Diseases, Kaunas, Lithuania

Background

It is believed that small nerve bundles are damaged in the earliest stages of neuropathy caused by diabetes mellitus (DM). Our goal was to evaluate and compare anatomical characteristics of corneal nerve fibers and corneal sensitivity in type 1DM patients and in healthy control subjects.

Methods

30 patients with type 1DM and 10 non-diabetic healthy subjects underwent a corneal confocal microscopy to evaluate the corneal sub-basal nerve fibers (density, number of nerves and branches, total nerve length) and contact corneal aesthesiometry.

Results

Diabetic patients had significantly lower corneal nerve fiber density ($14,32 \pm 5,87$ vs. $19,71 \pm 5,59$ mm/mm² $p=0,023$), nerve branches number ($4,57 \pm 3,91$ vs. $9,90 \pm 5,8$ n°/image, $p=0,006$), nerve fiber length ($2,28 \pm 0,94$ vs. $3,13 \pm 0,89$ mm, $p=0,032$) and corneal sensitivity ($1,13 \pm 0,29$ vs. $0,98 \pm 0,058$ gr/mm² $p=0,02$), as compared with controls. A negative correlation was found between corneal nerve fiber length, corneal nerve number, corneal nerve fiber density and diabetes duration ($p<0,05$).

Conclusion

Corneal confocal microscopy and corneal sensitivity evaluation may help to evaluate early changes in the sub-basal nerve plexus typical to diabetic neuropathy in patients with DM. Further studies using corneal confocal microscopy as a novel noninvasive technique are needed to locate the earliest alterations in corneal nerves in patients with type 1DM possibly predicting the development of neuropathy.

P4 Ocular hemodynamics in acute glaucoma attack

Joseph Cmelo¹; Eleonora Cmelova¹

¹Center of Neuro-ophthalmology, Bratislava, Slovakia

Background

Ocular Hemodynamics is one of the risk factors of Glaucoma. Changes in haemodynamic conditions of the intraocular pressure (IOP) are well known. However, there are little relevant datas about haemodynamics in acute glaucoma attack and afterwards. Experimental data do not reflect real changes in hemodynamics.

Methods

This small study is presented with haemodynamic monitoring by Color Doppler ultrasonography of the Eye during the acute Glaucoma seizure during anti-diuretic therapy after stabilization IOT and after antiglaucoma surgical practice at different times.

Results

IOP acute increase above 40 torr. It causes significant hemodynamic deterioration in the central retinal artery (CRA) and choroideal flow (CHF). Haemodynamics of the ophthalmic artery and the posterior ciliar artery did not show significant changes. IOP reducing IOP to a physiological level, the CRA hemodynamics and CHF are also modified. IOP reducing to the physiological values were also adjusted hemodynamic parameters in ACR and CH stream. After subsequent glaucoma surgery in one eye have been further improved flow parameters in both eyes, which persisted for several months. After the glaucoma surgery, the second eye is already further changes in hemodynamics to avoid any eye. It is interesting that even after the ocular massage slightly modifies haemodynamic parameters of the eyes.

Conclusion

These data indicate:

- The haemodynamics of CRA and CHF is seriously damaged in acute attack of glaucoma.
- The need for immediate antidiuretic therapy. Glaucoma surgery is needed as soon as possible if the IOP is not modified to normal.

P5 Genetic Diagnosis of the lens subluxation in Marfan syndrome

Eleonora Cmelova¹; Slavka Machalova¹; Nikola Matejovicova¹; Joseph Cmelo¹

¹Department of Clinical Genetics, University Hospital, Bratislava, Slovakia

Background

Marfan syndrome is a rare systemic disorder of the connective tissue affecting skeletal, cardiovascular system and also eyes. The estimated prevalence within different ethnic groups is 1:3-5,000. We provide intra-familial phenotype variability, new diagnostic criteria and autosomal dominant inheritance information within casuistic of a 16-year old male subject with fully developed signs of Marfan syndrome and within gentle phenotype of his father. We managed to provide evidence of identical, up to now undefined, “splicing” mutation c.7820-1G>A within FBN1 gene in its heterozygous state. The actual usage of genetic diagnostic tests in order to confirm exact diagnosis significantly contributes to improvement of comprehensive health care management provided to subjects with this potentially fatal disorder.

P6 Demographic characteristics and functional disease progression in open angle glaucoma patients

Alice Chandra Verticchio Vercellin^{1,2}; Alon Harris¹; Katherine Hutchins¹; Thai Do¹; Brent Siesky¹

¹Department of Ophthalmology, Indiana University School of Medicine, Indianapolis, IN, USA; ²University Eye Clinic, IRCCS Policlinico San Matteo, Pavia, Italy

Background

The aim of this study is to examine functional disease progression in open angle glaucoma (OAG) patients of different diabetic status, age, gender, and body mass index (BMI).

Methods

112 patients with OAG were assessed for systemic blood pressure (BP) and ocular perfusion pressure (PP), optic nerve head (ONH) morphology by Heidelberg retinal tomography 3 (HRT3), retrobulbar and capillary

blood flow by color Doppler imaging (CDI) and Heidelberg retinal flowmetry (HRF), respectively, every 6 months for a 5 year period. Patients were divided in subgroups according to: diabetes mellitus (DM), age, gender, and BMI (normal weight, NW: BMI 30). Functional disease progression was monitored with 24-2 Swedish interactive thresholding algorithm visual field exam using Humphrey visual field monitor and defined as two consecutive visits with mean deviation decrease ≥ 2 and/or advanced glaucoma intervention study increase ≥ 2 compared to baseline. Time to functional progression was analyzed using Cox proportional hazards models. Interactions were tested to determine if the effects of the factors on progression time differed by subgroups.

Results

In diabetic patients only, the baseline ONH parameters assessed by HRT3 were associated with shorter time to functional progression with a significant difference compared to patients without DM (cup area: $p=0.0254$; cup volume: $p=0.0089$; cup/disk area ratio: $p=0.0382$; linear cup/disc ratio $p=0.0437$; mean cup depth: $p=0.0013$; cup shape: $p=0.0160$). Baseline inferior mean flow evaluated by HRF was associated with shorter time to functional progression in OB patients but neither in NW nor OW patients, leading to a significant difference between groups ($p=0.0317$). 1-unit change in the ophthalmic artery (OA) peak systolic velocity (PSV), end diastolic velocity (EDV), and temporal posterior ciliary artery (TPCA) EDV measured by CDI were predictive of functional progression in OAG patients aged < 65 years after 5 years, with a significant difference compared to OAG patients aged ≥ 65 years (OA PSV: $p=0.0140$; OA EDV: $p=0.0373$; TPCA EDV: $p=0.0086$). In males only, 1-unit change in the systemic BP and ocular PP were associated with shorter time to functional progression, leading to a significant gender difference (systolic BP: $p=0.0178$; diastolic BP: $p=0.0230$; mean arterial pressure: $p=0.0156$; systolic PP: $p=0.0060$; diastolic PP: $p=0.0066$; ocular PP: $p=0.0061$; mean PP: $p=0.0035$).

Conclusion

Functional glaucoma progression may be influenced and predicted by different parameters in different individuals. Important considerations in different groups of patients may include: DM, age, gender, and BMI.

P7 Glaucoma—the importance of evaluating intracranial pressure

Joseph Cmelo¹; Eleonora Cmelova¹; Zuzana Mandakova¹; Nikola Matejovicova¹; Jana Camajova¹

¹Center of Neuroophthalmology, Bratislava, Slovakia

Background

The optic nerve is the boundary between two areas of pressure - intra-ocular pressure (IOP) and retrolaminar pressure corresponding with intracranial pressure (ICP). Both areas are separated by the cribriform plate. When assessing the risk or progression of glaucoma is evaluated only one component of the pressure gradient - IOP. Experimental and also numerous clinical studies indicate that for glaucoma progression is not important only IOP, as well as the pressure gradient at the cribriform plate – Translaminar gradient (TLG) is the difference intraocular and intracranial pressures. IOP is physiologically 10-21 torr, ICP average of 5 to 15 torr.

Methods

In our department the intracranial pressure was measured with a digital oftalmodynamometry (D-ODM). The measured values were calculated with the pulsatility index of the central retinal artery and IOP in mathematical formula. Validity values with using D-ODM was compared with the direct measurement of ICP at the Department of Neurosurgery.

Results

Results similarly in other authors have shown that, under physiological conditions, the TLG was 2.5 ± 2.4 torr. In ocular hypertension TLG was 2.1 ± 1.7 . Higher difference was found in glaucoma. In patients with primary open-angle glaucoma TLG was 12.5 ± 4.1 torr. In patients with so-called low tension glaucoma, the TLG was 6.6 ± 3.6 torr.

Conclusion

It seems that the progression of glaucoma is affected not only by IOP but by translaminar pressure gradient. To be effective in glaucoma therapy should be evaluated not only IOP but also TLG.

P8 Transcorneal electrical stimulation rescues retinal ganglion cells in acute glaucoma via inhibition of NFκB-p65

Lin Fu¹; Amy Lo¹; Jimmy Lai¹; Kendrick Shih¹

¹*Department of Ophthalmology, Faculty of Medicine, University of Hong Kong*

Background

Transcorneal electrical stimulation (TcES) has been shown to reduce retinal ganglion cells (RGCs) death from various insults in animal models as well as human ocular disease. IOP lowering is the major effective management in acute angle closure glaucoma. However, there are still a large portion of patients develop visual loss even under treatments. In addition, early effective management is very critical in glaucoma. Here we are aiming to investigate the potential neuroprotective effect of TcES in an acute glaucoma model.

Methods

To induce acute ocular hypertension (AOH), 2.6m high of balanced salt solution(BSS) was infused to one eye of each gerbil for 1hour. In the treatment group, transcorneal electrical stimulation (TcES) was performed to the surgical eye immediately and 3 days after AOH. In the control group, sham TcES was given to the surgical eye at the same time points. Number of RGCs was counted from the superior, inferior, temporal and nasal areas by immunofluorescence staining after the gerbils were sacrificed. To measure the retinal function, full field flash electroretinogram (ERG) was performed on day 3 and day 6. The behavioral visual function was evaluated by the light/dark transitional box test. Western blot was conducted to see the changes of IL-10, IL-6, Cox-2 and nuclear factor kappa B(NFκB).

Results

An acute glaucoma model was established within RGCs loss in the superior retinal area. TcES treatment rescued RGC from apoptosis in this area and preserved RGC function together with improved behavioral visual function. The western blot showed elevation of IL-10 and down-regulation of NFκB-p65 activation, IL-6, Cox-2 level in the TcES group compared to the control group.

Conclusion

Our work demonstrated the neuroprotective effect of TcES on RGCs in acute glaucoma and these findings suggested its effect act through the NFκB signaling pathway with regulation of several inflammatory factors.

P9 Body mass index affects functional progression in open angle glaucoma patients

David Camp¹; Alon Harris¹; Brent Siesky¹; Nicholas Moore¹; Alice Verticchio²

¹Department of Ophthalmology, Indiana University School of Medicine, Indianapolis, IN, USA; ²University Eye Clinic, IRCCS Policlinico San Matteo, Pavia, Italy

Background

To examine ocular blood flow, optic nerve head (ONH) structural parameters and functional progression in open angle glaucoma (OAG) patients with different body mass index (BMI: normal weight, NW, BMI 30) over 5 years.

Methods

111 patients with OAG (38 NW; 40 OW; 33 OB) were assessed for structural ONH parameters as measured by Heidelberg retinal tomograph 3 (HRT3) and for retrobulbar blood flow by color Doppler imaging at baseline and every 6 months for a 5-year period. 75 patients (29 NW; 25 OW; 20 OB) were assessed at 5-year follow-up. Functional disease progression was monitored with 24-2 Swedish interactive thresholding algorithm visual field exam and was defined as two consecutive visits with mean deviation decrease ≥ 2 and/or advanced glaucoma intervention study increase ≥ 2 compared to baseline. Time to functional progression was analyzed using Cox proportional hazards models. Interactions were tested to determine if the effects of the factors on progression time differed by BMI category.

Results

1-unit change in the ophthalmic artery (OA) resistivity index (RI) was predictive of functional progression in OW patients and in the central retinal artery (CRA) RI was predictive of functional progression in OW and OB patients, but not in NW patients (OA RI: $p=0.0483$; CRA RI: $p=0.0148$). 1-unit change in HRT3 cup area, cup volume and cup/disk area ratio was predictive of functional progression only in OW patients, not in NW or OB patients, with a significant difference between BMI groups (p -value = 0.0064, 0.0024, 0.0085, respectively).

Conclusion

Changes in structural ONH parameters and in retrobulbar blood flow may be more predictive of functional progression in OAG patients with greater BMI.

P10 The new surgical device of micro-invasive subconjunctival stent: does it really work?

Jacopo Maria Guidotti¹; André Mermoud¹

¹Montchoisi Clinique, Centre d'Ophthalmologie, Lausanne, Switzerland

Background

To establish the safety and efficacy of the minimally-invasive ab-interno subconjunctival implant in reducing IOP in mild, moderate and severe open angle glaucoma patients. The Stent is a glaucoma drainage implant. Its aim is to reduce the IOP in patients with primary open angle glaucoma where previous medical treatments have failed, to reduce the complications of traditional glaucoma surgery through the use of a quick and less invasive *ab interno* procedure because does not require conjunctival or scleral dissection. Our study has the aim to evaluate whether this new treatment actually reaches the targets expected in different types of patients. We became interested in it because it has great potential: fast surgery; fewer complications; faster recovery of the patient; it reduces the IOP keeping it low over time, but doesn't rule out any other type of surgery in case the stent is not working.

Methods

55 subjects, different age, different kind of glaucoma, from 2 surgeons were followed for 10 months, and their outcomes for mean IOP, IOP change, reduction in medications, visual acuity and safety were recorded.

Results

After 8 months of follow up, the results are good, fully reaching the target and with a lot of interesting advice.

Conclusion

Interesting IOP reduction; Post OP treatment; Complication; Advice.

For more information:
www.glaucomacongress.com

P11 Optical Coherence Tomography Angiography and Color Doppler Imaging in glaucoma diagnostics

O. Kuryшева¹; T.N. Kiseleva¹; E.V. Maslova¹; O.A. Parshunina¹;

A.V. Fomin¹

¹Ophthalmological Center of the Federal Medical and Biological Agency, Moscow, Russia

Background

Vascular factors may be important in the pathophysiology of glaucoma. A practical method for the clinical evaluation of ocular perfusion is needed to improve glaucoma management. Objective: To detect peripapillary retinal perfusion and retrobulbar blood vessels velocities in glaucomatous eyes compared with normal eyes using optical coherence tomography (OCT) angiography and Color Doppler Imaging (CDI).

Methods

74 glaucomatous eyes, and 12 age-matched normal eyes were analyzed. The optic disc region was imaged twice using a 3 × 3-mm scan by a 70-kHz, 840-nm-wavelength spectral OCT system. The split-spectrum amplitude- decorrelation angiography algorithm was used. Peripapillary flow index was calculated as the mean decorrelation value in the peripapillary region, defined as a 700-μm-wide elliptical annulus around the disc. For investigating blood flow velocity in retrobulbar vessels we used gray-scale ultrasound, Color Doppler Imaging (CDI) and pulsed-wave Doppler (PWD).

Results

Peripapillary flow index in glaucoma was lower than in normal eyes (0.052 ± 0.01 and 0.0611 ± 0.02 respectively, $p=0.001$) as well as the central retinal artery (CRA) end diastolic velocity (EDV): 4.1 ± 2.3 cm/s and 4.5 ± 1.1 cm/s respectively ($p=0.006$) and central retinal vein (CRV) mean velocity: 4.4 ± 0.9 cm/s and 7.1 ± 2.5 cm/s respectively. Peripapillary flow index was correlated with ophthalmic artery EDV (Pearson $r = 0.475$, $p=0.008$) in normal eyes. CRV peak systolic velocity (PSV) in normal eyes and CRA PSV in glaucomatous eyes were highly correlated with visual field pattern standard deviation: Pearson $r = -0.8$ ($p=0.004$) and Pearson $r = -0.45$ ($p=0.009$) respectively.

Conclusion

OCT angiography of peripapillary region and CDI of retrobulbar vessels may have value in future studies to determine their potential usefulness in glaucoma evaluation.

P12 Quick Cognitive Function Evaluation in Normal Tension Glaucoma

Akvile Daveckaite¹; Evelina Grusauskiene²; Kęstutis Petrikonis²; Antanas Vaitkus²; Ingrida Januleviciene¹

¹Department of Ophthalmology, Lithuanian University of Health Sciences, Kaunas, Lithuania; ²Department of Neurology, Lithuanian University of Health Sciences, Kaunas, Lithuania

Background

The aim of the study was to perform a quick cognitive function assessment using Clock Drawing Test (CDT) and compare between normal tension glaucoma (NTG) and cataract patients.

Methods

30 patients with NTG and 30 patients with cataract were included in a prospective pilot study. The pre-drawn circle was given and patients were asked to draw the clock showing the time 11:10. Test was evaluated by the method of Rakusa, using a 4 point scoring scale. Time was evaluated, but there was no time limit. Medical history was obtained. The level of significance was set at $p < 0.05$.

Results

CDT result was significantly better in cataract group than in NTG group: 3.23 (0.94) point and 2.33 (1.24) point, respectively ($p = 0.004$). 60% ($n = 18$) of NTG group and 10% ($n = 3$) of cataract group patients have completed the CDT by the specific picture manner, ($p = 0.001$).

Conclusion

Lower CDT results and specific drawing manner were more common in NTG patients. Further prospective studies are needed to investigate CDT as fast screening test reliability in NTG patients.

P13 Assessment of the role of Central Corneal Thickness (CCT) in measuring the Intra Ocular Pressure (IOP), in the screening for Glaucoma amongst people residing in a Sub-Himalayan territory of North India

Anil Verma¹; Anil Chauhan¹; Dinesh Kumar¹; Gaurav Sharma¹

¹Department of Ophthalmology, Dr Rajendra Prasad Government Medical College, Kangra at Tanda (H.P) India

Background

CCT affects the IOP recording, leading to measurement errors further influencing the diagnostic capacity for Glaucoma. Precision of measurement can be improved by the use of advanced technology, so the present study was planned to measure the difference in screening for Glaucoma using IOP measured by applanation tonometer, and an IOP corrected for central corneal thickness (CCT) measured using ultrasonic pachymeter. This study was done for the first time among people residing in a Sub-Himalayan territory of North India.

Methods

This study derived its results from a community based cross-sectional study among individuals of > 30 years of age in a rural area with a population of 0.13 million in the state of Himachal Pradesh, India. A sample size of about 2600 was calculated assuming 2.5% prevalence of Glaucoma at 5.0% level of significance and 80.0% study power. The IOP was measured first by Perkin's applanation tonometer (PAT) and then the CCT was measured with an Ultrasonic Pachymeter by the same ophthalmologist in a single setting. Based on this the IOP corrected for the CCT was calculated. The readings based of IOP alone and corrected IOP was compared.

Results

Total 2603 participants (75.85) were studied with mean CCT of 528.7 μm (SD+34.4) in the right and 529.6 μm (SD+35.2) in the left eye. The mean IOP (mm of Hg) was corrected from 13.7 (SD+2.9) to 14.7 (SD+3.4) ($p=0.00$), and 13.9 (SD+2.8) to 14.8 (SD+3.3) ($p=0.00$), in the right and left eye respectively. The prevalence of increased pressure was observed to be 0.7% based on corrected IOP and 0.5% by PAT, whereas glaucoma suspects were found to be more prevalent (5.0%) based on corrected IOP considering CCT than by IOP measured alone with PAT (1.5%).

Conclusion

It was found that the average CCT in the study population was lesser in comparison to the mean CCT among Caucasians resulting in underestimation of the IOP measured by PAT inducing a Type II error potential to reduce the sensitivity, increase in false negative rate, and reducing the diagnostic odds ratio for glaucoma. It is recommended that measurement of CCT using the ultrasonic pachymeter should be done in all suspected cases of glaucoma especially as it is a non-invasive method and can be used to screen the population in the peripheral institutes as well.

P14 To study Bleb morphology in Trabeculectomy vs Phacotrabeculectomy using ASOCT and Slit lamp biomicroscopy

Meenakshi Dhar¹; Srishti Kamalmani Gulati¹

¹Ophthalmology Department, Amrita Institute of Medical Sciences, Cochin, Kerala, India

Background

Success of a filtering surgery depends on bleb functionality. Flat blebs may be functional, and large blebs may be cystic or encapsulated, but non-functional. Bleb morphology on slit lamp has been used to assess blebs, with multiple classification systems with their own fallacies. Anterior segment OCT is noninvasive, reproducible objective measure of bleb parameters. Qualitative & quantitative bleb characteristics can be studied to assess its functionality-Bleb height & reflectivity, Bleb wall height & reflectivity, posterior extent of bleb, opening of the internal ostium etc. We studied the difference in bleb characteristics between patients with phacotrabeculectomy & trabeculectomy to see if and how they differ.

Methods

Bleb morphology was studied in patients of Trabeculectomy [n=11] and Phacotrabeculectomy [n=17] with AS-OCT and slitlamp biomicroscopy. Successful blebs had IOP=10 was considered successful. Each bleb was evaluated on slit lamp based on Wuerzeberg classification, photo was also taken. AS OCT was done for the bleb with the Visante. Comparison of quantitative parameters like bleb wall thickness & reflectivity; bleb height & posterior extent was done in the two groups. The qualitative parameters were assessed as well.

Results

Cystic blebs were seen in Trabeculectomy only group. Blebs in phacotrabeculectomy had lesser bleb height, more echogenicity, more diffuse, with more bleb wall thickness. The successful blebs in each group had greater posterior extent, thicker bleb walls. In all successful blebs the internal ostium of the trabeculectomy was open. Flaps with MMC had more bleb height, as also rectangular blebs.

Conclusion

Trabeculectomy blebshad greater bleb height than phacotrabeculectomy although not statistically significant. More cystic blebs in Trabeculectomy alone. Internal reflectivity was more in Phacotrabeculectomy than in trabeculectomy alone.

A larger study is needed to get statistical significance.



find us on twitter:
@GlauCongress and #ICATTG15



find us on facebook:
www.facebook.com/glaucomacongress

Sponsors & Exhibitors

Exhibition

A small exhibition area is located just outside the Rogers room (see page 11 for map).

Opening hours

Thursday: 16:30 – 17:30

Friday: 10:00 – 15:00

Saturday: 10:00 – 12:00

Booth 1



Profile: tpm taberna pro medicum GmbH, an ISO 13485 certified company, was founded in 1978 and is proud to be the global leader in digital high frequency ultrasound for skin diagnostics. From the beginning to date tpm produces, distributes and services medical products in the fields of dermatology, cosmetics and ophthalmology. Everything from one source: development, production, maintenance, repair, sales and service made in Germany. Our product portfolio contains high frequency ultrasound systems for dermatology and cosmetics as well as cryo systems and accessories for ophthalmology.

Ophthalmology: In 1993 we started a new development for ophthalmology, our EMS, the 'Electrophysiological Modular System' for VEP, ERG, EOG and OK examinations. We introduced this system in 1994 to the market. Until now we are still working together with national experts in ophthalmology for research and development. Currently we are finalizing a new development for measuring the ocular perfusion pressure and the ocular perfusion reserve.

www.tpm.eu

Booth 2



Profile: Kugler Publications (est. 1974) is an independent publishing company specialized in Ophthalmology, ENT and related fields. Kugler has built a rich experience and solid reputation in publishing books, journals, proceedings and other publications; both in print and electronic. Here at Kugler Publications we aim to keep Simon Kugler's warm personal touch, and way of doing business based on trust, friendship and long lasting relations incorporated into our everyday company culture. Drop by our booth to: browse our publications, obtain sample copies of journals [Asian Journal of Ophthalmology; Journal for Modeling in Ophthalmology (JMO); International Glaucoma Review (IGR)], view history of ophthalmology books (Wayenborgh Publications) or discuss your publications ideas.

www.kuglerpublications.com



The International Congress of
**ADVANCED TECHNOLOGIES &
TREATMENTS FOR GLAUCOMA**
October 29-31, 2015



www.glaucomacongress.com