**Poster Session 1**

**ANGLE CLOSURE GLAUCOMA**

**P1**

**CASE REPORT ON PAPILLARY BLOCK ANGLE CLOSURE ASSOCIATED TO PHAKIC POSTERIOR CHAMBER INTRAOCULAR LENS**

J. Bardavio, A. Punti, F. Duch, A. Anton
1 Department of Glaucoma, Institut Catala de Retina, Barcelona, 2 Department of Refractive Surgery, Institut Catala de Retina, Barcelona, Spain

**Purpose:** To report a case series of patients that suffered acute angle closure due to papillary block associated with the insertion of a phakic posterior chamber intraocular lens (PPC IOL).

**Methods:** Retrospective case series. Medical records of patients who presented with acute ocular hypertension (OHT) due to papillary block after insertion of a PPC IOL were reviewed. A description of preoperative routine clinical findings, the OHT findings, management and evolution is given.

**Results:** Five patients that underwent PPC IOL implantation from January 2003 till January 2008 in our institution were detected from our database. All patients had been treated to correct high myopia. Four presented pupil block angle closure from our database. All patients had been treated to correct high myopia. Four presented pupil block angle closure due to papillary block associated with the insertion of a phakic posterior chamber intraocular lens (PPC IOL).

**Conclusion:** The cause of papillary block angle closure OHT after PPC IOL implantation is probably multifactorial. Inefficient peripheral iridotomies and PPC IOL oversize seem to be causes of papillary block. Direct measure of posterior chamber diameter seems important as well as secure permeability of peripheral iridotomies.

**P2**

**EFFECTS OF PHACOEMULSIFICATION IN PATIENTS WITH PRIMARY ANGLE CLOSURE**

S. Cha, J. Lee, K. Lee
1 Department of Ophthalmology, Yeungnam University Medical Center, 2 Cheil Eye Hospital, Korea

**Purpose:** To evaluate the effects of phacoemulsification on corneal endothelial cell and intraocular pressure (IOP) in patients with primary angle closure.

**Methods:** We retrospectively reviewed medical records of 55 patients (64 eyes) who had undergone phacoemulsification and intraocular lens implantation for visually significant cataract patients with previous primary angle closure attack. The following topics were addressed: assessment of drainage angle, practice of peripheral iridotomy, practice of treating acute angle closure glaucoma and practice of performing cataract surgery in eyes with previous angle closure.

**Results:** There were no significant differences in endothelial cell density and IOP between two groups, preoperatively. The corneal endothelial cell density decreased by 12.8% ± 9.0% in attack group and 11.1% ± 6.9% in control group without significant difference between two groups 3 months after phacoemulsification (p = 0.832). However, the IOP reduction rate (16.7% ± 13.1%) of attack group was significantly greater than that (4.7% ± 25.8%) of control group at final follow-up visits (p = 0.021) without increase of glaucoma medications.

**Conclusions:** This study suggests that the phacoemulsification and intraocular lens implantation is relatively safe surgery for cataract patients with previous primary angle closure attack in addition to its beneficial effect on IOP control.

**P3**

**CONVENTIONAL VERSUS MODIFIED LASER IRIDOTOMY IN EYES WITH PRIMARY ANGLE CLOSURE: ANTERIOR CHAMBER MEASUREMENTS WITH PENTACAM®**

J. Choi, H.J. Kim, J.Y. Choi, Y.D. Kim
HanGil Eye Hospital, Korea

**Purpose:** To compare the conventional laser iridotomy (LI) and the modified LI in the aspect of the anterior chamber dimensional changes measured by Pentacam® in eyes with primary angle closure (PAC).

**Methods:** 48 eyes of 24 subjects with bilateral PAC were consecutively recruited. Each eye was randomly allocated to the conventional or modified LI. Modified LI was comprised of simultaneous argon LI and peripheral laser iridoplasty, whereas conventional LI only consists of argon LI. Each patient had anterior chamber measurements by Pentacam® before and 2 weeks after LI. Mean anterior chamber depth (ACD), anterior chamber volume (ACV), anterior chamber angle (ACA) at temporal and nasal side were measured before and after LI. Topographic ACD analysis was performed in the central and peripheral zone of anterior chamber. The results were compared between the conventional and modified LI groups.

**Results:** In both conventional and modified LI groups, mean ACD and ACV increased significantly. Topographic ACD analysis revealed that ACD increase after LI was prominent in the peripheral zone, whereas it remained unchanged in the central zone for both groups. Peripheral ACD increase was significantly larger in the modified LI group than in the conventional LI group (p < 0.05, 170.6 ± 23.2 µm increase in the modified group versus 79.2 ± 12.5 µm increase in the conventional group).

**Conclusions:** Both the conventional and modified LI increased mean ACD and ACV. Modified LI may have a role for the treatment of PAC by simultaneously relieving papillary block and angle crowding components.

**P4**

**NATIONAL SURVEY ON THE MANAGEMENT OF PRIMARY ANGLE CLOSURE BY UK CONSULTANTS**

S. Dulku, P. Pandey, A. Bansal, D. Trivedi, V. Sung
Birmingham and Midland Eye Centre, United Kingdom

**Purpose:** Angle closure glaucoma (ACG) is a sight threatening condition requiring prompt treatment. In our experience there appears to be a wide variation in its management. The aim of this study was to survey current practice and compare to peer reviewed literature.

**Methods:** A questionnaire was mailed to all 994 UK consultant ophthalmologists in October 2007. The following topics were addressed: assessment of drainage angle, practice of performing peripheral iridotomy, practice of treating acute angle closure glaucoma and practice of performing cataract surgery in eyes with previous angle closure.
Results: 273 (27%) responded. 15 were excluded due to being retired (2), incomplete questionnaire (2) or not routinely managing the condition (11). 81 (31%) had an interest in glaucoma of which 63 (77%) also accept tertiary referrals. All respondents use gonioscopy to assess the angle. The most common grading system is the Shaffer system (66%). When performing prophylactic peripheral iridotomy (PI), 50% prescribe regular pilocarpine until the procedure is carried out. At the time of laser, 58% use a pressure lowering agent (apraclonidine) to prevent pressure spikes. 89% do bilateral PI in one sitting. Only 55% check the intraocular pressure on the same day following treatment. Most (58%) review patients within 2 weeks. 61% routinely perform post-PI gonioscopy. When treating acute angle closure, only 15% routinely use biometry to assess the eye. For uncontrolled intraocular pressure after laser, the most common procedures in use were cataract surgery (68%), clear lens extraction (58%) and trabeculectomy (51%). Less common were diode laser (18%) and goniosynechiolysis (13%). 87% perform cataract surgery in patients with previous ACG. For biometry, the preferred formulae for eyes with short axial length (< 22 mm) were Hoffer Q (64%) and/or SRK-T (29%). 84% noted an increase in complications in these eyes, the most common being iris prolapse (62% of respondents) and aqueous misdirection (29%).

Conclusions: There is considerable variation in the practice of treating angle closure glaucoma in the UK. In certain areas, however, there is greater consensus. The results of this survey may be of use in developing guidelines for the treatment of this condition.

**P6**

**PREVALENCE OF INTERMITTENT HEADACHE PRECEDING ACUTE ANGLE CLOSURE ATTACK**

M.J. Kim, T. Kim

Seoul National University Bundang Hospital, Korea

Purpose: To investigate the prevalence of antecedent preceding intermittent angle closure (IAC) in patients with acute angle closure (AAC) attack.

Methods: We prospectively collected the history of preceding symptoms that may be potentially associated with IAC, such as headache, ocular pain, blurred vision and halo in patients who were treated with AAC attack in our clinic between January 2005 to November 2007. The association of those symptoms with IAC was confirmed by the disappearance of the symptoms after laser peripheral iridotomy.

Results: Of 89 AAC patients included in the study, 26 patients (28.9%) reported previous experience of intermittent headache and/or ocular symptoms such as ocular pain, blurred vision and halo. The symptoms disappeared after laser peripheral iridotomy in all the 26 cases. The mean duration of the antecedent symptoms was 52.0 ± 61.0 months.

Conclusions: It is estimated that 28.9% of patients with acute angle closure attack had antecedent experience of IAC. This data suggest that careful history taking and timely referral of suspected patients to ophthalmologists by the physicians who treat headache may substantially reduce the incidence of AAC.

**P7**

**IS GONIOSYNECHIALYSIS (GSL) AN EFFECTIVE AND SAFE PROCEDURE FOR PRIMARY ANGLE CLOSURE (PAC) WITH EXTENSIVE PERIPHERAL ANTERIOR SYNECHIAE (PAS)?**

V. Sung1, G. Lascaratos2, L. Jones3, D. Rachdan4, M. Chakrabarti4

1 Consultant Ophthalmic Surgeon, 2 Senior House Officer, 3 Glaucoma Fellow, 4 Specialist Registrar, United Kingdom

Purpose: Managing acute PAC with significant PAS can be challenging with many treatment modalities demonstrating poor success rates. The purpose of our study was to determine the safety and efficacy of GSL for PAC with significant PAS.

Methods: Retrospective case-note review of consecutive cases of 17 eyes of 16 patients that have had acute PAC with more than 180 degrees of PAS treated with GSL over a 3-year-period. Success was defined as intraocular pressure (IOP) < 21 mmHg with or without glaucoma medications and no further glaucoma procedures performed. Statistical analysis was performed with Paired t-tests. Results: The mean period from PAC attack to GSL was 5.8 months. The mean pre-operative IOP and number of glaucoma medications were 22.6 mmHg and 3.4 respectively. The mean pre-operative PAS was 277 degrees. GSL alone was performed on 5 eyes (29.4%), combined with phacoemulsification and IOL on 10 eyes (58.8%) and combined with core vitrectomy, phacoemulsification and IOL and hyaloid-iridectomy on 2 eyes (11.7%). Mean follow-up was 12.8 months (0.6-30.3 months). Last follow-up visit showed significant reduction in the mean IOP and glaucoma medications (16 mmHg and 1.8 respectively, p < 0.05). The mean PAS also improved significantly (144 degrees, p < 0.05). Fifteen eyes (88.2%) were classified as success, while two eyes underwent trabeculectomy with mitomycin C at 4.4 and 7.6 months following GSL. Post-operative complications including fibrinous uveitis (two patients) and cystoid macular oedema (two patients) were recorded. They all resolved with treatments.
Conclusions: GSL is effective and safe procedure in controlling IOPs in patients with extensive PAS and could therefore delay or prevent glaucoma filtration surgery.

**P8**
THE ROLE OF PERIORBITAL BOTOX INJECTION IN RELIEVING HEADACHE AFTER ACUTE ANGLE CLOSURE GLAUCOMA ATTACK
D. Lu, M. Tai
Dept. of Ophthalmology, Tri-Service General Hospital, Taipei, Taiwan

Purpose: To report the experience of using periorbital botox in treating headache and neck pain caused by acute angle closure glaucoma attack.

Methods and patients: Twelve patients after acute angle closure glaucoma attack with intermittent headache and neck pain were enrolled in this study. All patients underwent periorbital botox injection with doses between 40 to 60 units on the acute attack side and cosmetic balance injection 10 to 20 units on the other side. After injection, the changes in pain modalities and face appearance were recorded and analyzed. The patients were followed up for at least three months.

Results: In the majority of the patients (83%), the sensation of pain around periorbital region and neck subsided in 30 minutes after botox injection. The average duration for this pain-relief is 2.3 months. In addition, after botox periorbital injection, most (92%) patients were happy with their face appearance.

Conclusions: Periorbital botox injection is quite effective in relieving headache and neck pain caused by acute angle closure glaucoma attack. However, further long-term study is needed to evaluate its prolong effectiveness and possible influence on the intraocular pressure.

**P9**
COMBINED GONIOSYNCHIALYSIS WITH DOUBLE-MIRROR GONIOLENS AND CATARACT EXTRACTION IN TREATMENT OF PRIMARY ANGLE CLOSURE/GLAUCOMA
K. Mori, Y. Ikeda, S. Naruse, A. Matsuda, K. Imai, K. Kimura, S. Kinoshita
Dept of Ophthalmology, Kyoto Prefectural University of Medicine, Kyoto, Japan

Purpose: To evaluate the efficiency of combined goniosynchialysis (GSL) with double-mirror gonio lens (dmG) and phacoemulcification (PEA) in treatment of primary angle closure / glaucoma (PAC/G) retrospectively.

Methods: Forty-four eyes of 31 patients with cataract and PAC/G who had undergone combined GSL with dmG and PEA in year 2006 and 2007 were reviewed. Surgical procedures were performed as follows; after injection of viscoelastic material (Healon; AMO Japan, Tokyo, Japan), dmG (Mori Goniotomy Lens, Ocular Instruments Inc. Bellevue, WA, USA) was placed on the surface of the cornea. GSL was performed by moving spatula toward the peripheral anterior synchecia (PAS) and pushing down the peripheral iris through the view of dmG. Phacoemulsification and foldable posterior chamber intraocular lens (PC-IOL) implantation (Acrysof, Alcon Japan, Tokyo, Japan) were then performed with 2.4 mm small incision using Infinity micro coaxial system (Alcon Japan, Tokyo, Japan). Pre- and post-operative intraocular pressure (IOP) and complications were analyzed.

Results: Averaged age of all cases was 68.2 ± 9.4 years old. There included 7 eyes with post acute PAC, 7 with PAC/G by plateau iris, and 30 with chronic PAC/G. Mean observational period was 14.1 ± 5.9 months (range 4-25 months). GSL was safely performed where PAS was existed, checking around 360-degree gonio structure with dmG without tilting the patient’s head or microscope. After the surgery, anterior chamber depth was deepened in all cases, and IOP was reduced from the pre-operative 23.9 ± 8.5 mmHg to the post-operative 14.6 ± 3.9 mmHg. Only one eye needed further filtering surgery to control IOP. Faint hyphema were observed in some cases, which diminished in a few days. No other complications such as shallow anterior chamber, hypotony, uveal effusion, or infection were observed.

Conclusions: Combined goniosynchialysis with double-mirror gonio lenses and cataract extraction could be a safe and effective surgical procedure for managing primary angle closure/glaucoma patients with cataract.

**P10**
THE FACTORS THAT AFFECT THE CORNEAL ENDOTHELIUM IN PRIMARY ANGLE CLOSURE GLAUCOMA
J. Park, J. Yoon, K.H. Lee
St. Mary Eye Hospital, Korea

Purpose: To evaluate the factors that affect the corneal endothelium in PACG.

Methods: 1) The short-term effect of laser iridotomy on the corneal endothelium in PACG: 25eyes with narrow angle (group X) and 17patients going to be implanted the phakic IOL (group Y) were treated with argon and pulsed neodymium: YAG laser iridotomy. Corneal endothelial specular microscopy was performed before and after iridotomy at 1week. 2) The long-term effect of laser iridotomy on the corneal endothelium in PACG: 33eyes treated with laser iridotomy because of pupillary block (group A), 31eyes performed prophylactic laser iridotomy (group B), 30eyes not performed laser iridotomy (group C) were retrospectively reviewed about corneal endothelium. 3) The long-term effect of antiglaucoma eye drops on the corneal endothelium in POAG: 44eyes with POAG and 50eyes without glaucoma were retrospectively reviewed about corneal endothelium.

Results: 1) The decrease of endothelial cell density after iridotomy was not statistically significant at 1week (p = 0.248). There was no statistical difference at the change of endothelium between group X and Y. Partial correlation coefficients indicated no statistical correlation between the change in endothelial cell density and the total energy used during the treatment (γ = -0.0572, p = 0.670). 2) The mean endothelial cell density of group A was statistically significantly less than that of group B (p = 0.023). There was no statistical difference in the mean endothelial cell density between group B and C (p = 0.286). There was negative partial correlation between the number of pupillary block and endothelial cell density (γ = -0.3253, p = 0.01). There was no correlation between the period after iridotomy and the endothelial cell density (γ = 0.1260, p = 0.224). 3) There was no statistical difference in the mean endothelial cell density between POAG group and normal controls (p = 0.116). There was no correlation between the use of the antiglaucoma eye drops and the endothelial cell density in POAG (γ = -0.0267, p = 0.867).

Conclusions: Argon and Nd:YAG laser iridotomy don’t pose any short and long-term hazard to corneal endothelium in PACG. And the use of antiglaucoma eye drop don’t affect the corneal endothelial cell density. But the number of pupillary block associates with the decrease of endothelial cell density. Therefore argon and Nd:YAG laser iridotomy in PACG is considered as an effective and a safe procedure that prevent the acute pupillary block and corneal endothelial cell damage.
**P11**

**COMBINED PHACOEMULSIFICATION AND VISCOGONIOSYNECHIALYSIS IN PATIENTS WITH REFRACTORY ACUTE ANGLE-CLOSURE GLAUCOMA**

M.R. Razzeghinejad  
Associate Professor of Ophthalmology in Shiraz Medical University, Iran

**Purpose:** To evaluate the effectiveness of phacoemulsification and viscosgoniosynechialysis (PE-VGS) in managing refractory acute angle-closure glaucoma unresponsive to laser iridotomy and medical therapy.

**Methods:** Eleven patients with acute angle-closure glaucoma who did not respond to laser iridotomy and anti-glaucoma medications and who had ≤ 270º peripheral anterior synecchia in indentation gonioscopy underwent PE-VGS. Following phacoemulsification, the anterior chamber was deepened with viscoelastic; it was then injected near the angle, without touching any ocular structure, to release the peripheral anterior synecchia.

**Results:** A total of eleven patients with an average age of 58.9 years were included. Average preoperative intraocular pressure (IOP) was 39.4 mmHg, and mean follow-up time after PE-VGS was 7.8 months. After surgery, the mean IOP reduced to 15.4 mmHg (p = 0.003) and the mean number of anti-glaucoma medications was reduced from 3.8 pre-surgery to 0.4 post-surgery (p = 0.002). Mean LogMAR visual acuity improved from 0.94 to 0.55 (p = 0.007). None of the patients needed any other surgical intervention to lower IOP. In eight eyes (72.8%), the IOP was controlled without any antiglaucoma therapy. In all patients except for the one patient whose IOP was controlled by surgery (72.8%), the IOP was controlled without any antiglaucoma therapy. In those patients whose IOP was controlled with medication, one patient was on three and the others received only one medication. In all patients except for the one patient whose IOP was controlled by three medications, the previously occluded TM was exposed over 360 degree in gonioscopy in the last postoperative visit.

**Conclusion:** Phacoemulsification and viscosgoniosynechialysis seems to be an effective and safe treatment option for the management of refractory acute angle-closure glaucoma that is unresponsive to laser iridotomy and medical therapy.

---

**P12**

**BIOMETRIC VALUES IN THE AFFECTED AND FELLOW EYES OF PATIENTS WITH ACUTE PRIMARY ANGLE CLOSURE GLAUCOMA**

M.R. Razzeghinejad¹, M.H. Nowroozzadeh²  
¹ Assistant Professor of Ophthalmology in Shiraz University of Medical Sciences, ² Resident of Ophthalmology in Shiraz University of Medical Sciences, Iran

**Purpose:** To evaluate the biometric findings of the affected and fellow eyes of patients with acute primary angle closure glaucoma (APACG) and identify any differences of ocular characteristics that may contribute to the acute episode.

**Methods:** Twenty one subjects with unilateral APACG were treated properly by laser iridotomy and medical therapy. Two weeks later, keratometry, central corneal thickness, intraocular lens power, lens thickness (LT), anterior chamber depth (ACD) and vitreous chamber depth were measured. RLP and LAF were defined as (ACD + LT)/AL and ½ AL/AL, respectively.

**Results:** A total of 115 PACS subjects were included. The mean age was 63.3 ± 6.7 (50-87) years. The majority of subjects were Chinese (93%) and female (72%). In eyes that underwent LI, the endothelial cell density was lower at year 1 (2419.2 ± 383.7 cells/mm²) when compared to baseline (2738.3 ± 386.6 cells/mm²) (p < 0.05). There was also a decrease in endothelial cell density in the fellow untreated eye from baseline (2738.3 ± 408.3 cells/mm²) to year 1 (2399.8 ± 402.1 cells/mm²) (p < 0.05). There was no significant difference in the percentage decrease in cell density in eyes that underwent LI (11.5%) as compared to fellow eyes (11.3%) (p = 0.88).

**Conclusions:** In this cohort of PACS eyes, there were lower endothelial cell counts in both LI treated and control eyes after one year, but the percentage reduction was similar in both groups. The long term effects of LI on the corneal endothelium needs to be assessed.

---

**P13**

**EFFECT OF PROPHYLACTIC LASER IRIDOTOMY ON THE CORNEAL ENDOTHELIUM IN EYES WITH NARROW DRAINAGE ANGLES**

R. Kumar¹, M. Ang², P.T.K. Chew³, H. Wong⁴, B. Mani⁵, L. Raghavan¹, D.S. Friedman⁶, P.J. Foster⁷, T. Aung¹  
¹ Singapore National Eye Center & Singapore Eye Research Institute, Singapore, ² Singapore National Eye Center, Singapore, ³ National University Hospital, Singapore, ⁴ Tan Tock Seng Hospital, Singapore, ⁵ Singapore Eye Research Institute, Singapore AND Sankara Nethralaya, Chennai, India, ⁶ Wilmer Eye Institute and Johns Hopkins Bloomberg School of Public Health, Baltimore, WA, USA, ⁷ UCL Institute of Ophthalmology, London, United Kingdom

**Purpose:** To assess the effect of prophylactic laser iridotomy (LI) on corneal endothelial cell counts in a cohort of primary angle closure suspects (PACS).

**Methods:** As part of a randomized controlled trial, subjects over the age of 50 years and diagnosed as PACS in both eyes underwent prophylactic LI in one eye, while the fellow eye served as a control. PACS was defined as the presence of appositional contact between the iris and posterior trabecular meshwork for at least 180º on gonioscopy, with intraocular pressure ≤ 21 mmHg, and absence of peripheral anterior synecchia, glaucomatous optic neuropathy or visual field changes compatible with glaucoma. The central corneal endothelium of both eyes of all subjects were assessed using a non-contact specular microscope (Konan Noncon Robo SP-9000LC) at baseline and 1 year later. Only those eyes that had measurements on the same device were included.

**Results:** A total of 155 PACS subjects were included. The mean age was 63.3 ± 6.7 (50-87) years. The majority of subjects were Chinese (93%) and female (72%). In eyes that underwent LI, the endothelial cell density was lower at year 1 (2419.2 ± 383.7 cells/mm²) when compared to baseline (2738.3 ± 386.6 cells/mm²) (p < 0.05). There was also a decrease in endothelial cell density in the fellow untreated eye from baseline (2738.3 ± 408.3 cells/mm²) to year 1 (2399.8 ± 402.1 cells/mm²) (p < 0.05). There was no significant difference in the percentage decrease in cell density in eyes that underwent LI (11.5%) as compared to fellow eyes (11.3%) (p = 0.88).

**Conclusions:** In this cohort of PACS eyes, there were lower endothelial cell counts in both LI treated and control eyes after one year, but the percentage reduction was similar in both groups. The long term effects of LI on the corneal endothelium needs to be assessed.

---

**Poster Session 2**

**ANTERIOR SEGMENT IMAGING, ANGLE CLOSURE**

**P14**

**EFFECTS OF GLAUCOMA MEDICATIONS ON CORNEAL ENDOTHELIUM AND SUBBASAL NERVES**

A. Grise, A. Labbe, B. Dupas, C. Baudouin  
Department of Ophthalmology III, Quinze-Vingts National Ophthalmology Hospital, Paris, France

**Purpose:** The objective of this study was to evaluate antiglaucoma medications effects on epithelial cells and corneal nerves morphology.

**Methods:** Twenty seven corneas of patients treated for glaucoma were analysed by in vivo confocal microscopy (HRT II with Rostock module). Squamous metaplastic cells were eval-
uated, epithelial superficial cell count was performed. For subbasal nerves, central density was calculated and tortuosity graded. Clinical parameters (punctate superficial keratitis, conjunctival redness and subjective pain) were evaluated. Patients were divided into 3 groups according to the importance of topical therapy and local tolerance.

Results: Epithelial cells density was reduced in treated patients (p = 0.3). Desquamating cells were found for patients with bad local tolerance and were more frequent in multi-treated corneas (p = 0.0004). Sub-basal nerveal density was significantly lower in treated glaucomatous corneas (p = 0.0005), and this reduction was more important when local tolerance was poor (p = 0.06).

Tortuosity was significantly higher in glaucoma than control groups (p = 0.0001) and was correlated to the number of eyedrops.

Conclusion: Corneal alterations, especially on subbasal nerves, appeared in treated glaucomatous patients. These alterations were more pronounced when local tolerance was poor and treatment important.

**P15**

**DETECTION OF OCCLUDABLE ANGLES WITH THE PENTACAM AND THE ANTERIOR SEGMENT OPTICAL COHERENCE TOMOGRAPHY**

C.Y. Kim1, J.H. Yi1, S. Hong1, S.Y. Kang1, Y.K. Kim1, K.T. Ma2, G.J. Seong1

1 Institute of Vision Research, Department of Ophthalmology, Yonsei University College of Medicine, 1 Siloam Eye Hospital, Seoul, Korea

Purpose: To assess the efficacy of the Pentacam (PTC) and the Anterior Segment optical coherence tomography (AOCT) as a screening tool for the detection of occludable angles and to compare their discriminating ability for occludable angle detection.

Methods: 41 eyes of 22 subjects with gonioscopically diagnosed occludable angles and 32 eyes of 16 healthy volunteers with normal open angles were included in this study. Anterior chamber angle (ACA) and anterior chamber depth (ACD) were measured with PTC and AOCT. The receiver operating characteristic (ROC) curve was constructed for each parameter and calculated the area under the ROC curve (AUC).

Results: Values of ACA and ACD measured by PTC and AOCT were similar in normal open angle and occludable angle eyes. For detection of occludable angle, the AUCs of PTC with ACA and ACD were 0.935 (cut-off; 29.5 degrees) and 0.969 (cut-off; 2.27 mm), respectively. The AUCs of AOCT with ACA and ACD were 0.904 (cut-off; 31.8 degrees) and 0.947 (cut-off; 2.45 mm), respectively. With fixed sensitivity of 80.0%, the PTC showed 92.7% (ACA) and 100% (ACD) specificity, and the AOCT showed 85.7% (ACA) and 97.6% (ACD) specificity.

Conclusions: PTC and AOCT can take the angle images more than conventional gonioscopy. Because both instruments allow accurate discrimination between open and occludable angle eyes, they may aid to screening the occludable angles. Additionally, ACD measurement by PTC had the most powerful discriminating ability among various combinations.

**P16**

**CLASSIFICATION OF BLEBS WITH OCT**

H. Özçetin, M. Baykara, S. Türüdü

Uludag University, Medicine Faculty, Department of Ophthalmology in Bursa, Turkey

Purpose: Capability of the time domain optical coherence tomography (Starus OCT) to image filtering bleb after different kind of glaucoma surgery and its classification.

Methods: A post- or retroprospective case series was conducted in Uludag University, Medicine Faculty, Department of Ophthalmology in Bursa, Turkey. After performing different kind of glaucoma surgery such as trabeculectomy, trabeculec- tomy with MCC, deep scleral resection, time domain optical coherence tomography (Stratus OCT) carried out on filtration bleb. Vertical scan for height of bleb and horizontal scan for extent of bleb was used during scanning perpendicularly on the bleb apex. Also, scleral flap position was investigated in bleb cavity.

Results: Different kind of bleb imaging was investigated by Stratus OCT that was known to detect posterior pole disorders. All cases were analysed according to bleb configuration such as bleb height (BH0-3), bleb extent (BE0-3), bleb walls (thick, thin) inner structure of bleb, scleral flap position in bleb and relation with filtran glaucoma operation type. Usually trabeculectomy if new; BE2BH2 (normal), old; BE3BH3S (single large), trabeculectomy with MCC if new; BH3BE3S (large/dome shaped), old; BH3BE3M (multiple cystic) and deep scleral resection new; BE1BH1 and old; BE0BH0-1 type of bleb respectively.

Conclusion: Although it was not developed to evaluate the anterior segment of the eye, Stratus OCT is able to visualize the internal appearance of filtering bleb after glaucoma surgery. Non-invasive, non contact, retroductibl, high resolution capacity of the Stratus OCT is a objective imaging technique for investigating of filtering bleb. So we need to make a new classification of filtering bleb with this objective and reliable imaging method.
was calculated for 21 eyes. Mean angle volume before PI was 1.20 mm³ and after PI was 1.83 mm³ (p = 0.0001). The mean increase in angle volume was 0.63 mm³.

Conclusions: In eyes with narrow angles laser PI results in significant increases in angle width and volume. The increase in angle volume was proportionally greater than the increase in angle width. This suggests that small changes in angle morphology are more easily detected by measuring angle volume rather than width. This study confirms test-retest repeatability by a single observer with the Visante OCT in eyes with narrow angles but found significant variability in interobserver comparisons.

**Poster Session 3**

**BLOOD FLOW**

**P19**

**THE INFLUENCE OF ACUPUNCTURE TO OCULAR MICROCIRCULATION IN GLAUCOMA PATIENTS - A PILOT STUDY**

J. Hántszschel, L. Pillunat
University of Dresden, Germany

Background/Aims: Alternatively therapy options in the treatment of glaucoma are currently questioned (nearly 6% of the glaucoma patients). Acupuncture treatment is the most popular. To evaluate the efficiency of this therapy, the influence of the acupuncture to the ocular microcirculation of glaucoma patients was examined.

Methods: The data were obtained from 13 patients (7 male, 6 female), 21-69 years old (46 ± 17.5). The patients got a complete ophthalmologic examination. The ocular microcirculation was examined with the Retinal-Vessel-Analyzer (RVA), Heidelberg-Retinal-Flowmeter (HRF), Ocular-Blood-Flowmeter (OBF) before (-10min) and after (+10min) acupuncture treatment. During the acupuncture treatment we measured only with the RVA. The blood pressure and heart beat was checked manually. The group was divided by randomisation in two groups, the treatment group got a specific acupuncture and the control group got a non specific acupuncture schema. The study was randomized, blinded and prospective.

Results: The results of HRF show in the treatment group a significant increase in flow (196.7/241.3; p = 0.046), velocity (0.67/0.81; p = 0.043) and average flow (158.45/190.9; p = 0.016) and a increase in volume, which was close to significantly (12.92/14.4; p = 0.18). The control group had a generally moderate increase in these values, but did not achieve any significant levels for volume (13.25/14.52; p = 0.38), flow (201.15/230.24; p = 0.339), velocity (0.65/0.75; p = 0.276) and average flow (177.9/188.08). Results of RVA show a significant arterial vasoconstriction (110.95/105.32/108.81) in the specific acupuncture group with no significant changes in the venous diameters (129.23/127.06/129.83). The control group had no changes of the vessel diameters under the treatment (arteries 110.28/110.79/111.16; vein 138.58/138.58/138.69). Results of OBF did not reach the significant level in the specific acupuncture group, but are close to it (PA 3.3/4.2; p = 0.15), where the control group had no changes in the OBF-results (PA 4.7/4.76; p = 0.93).

Summary: We found a significant increase in peripapillary and choroidal micro perfusion with a specific acupuncture schema for eye compared to a non specific. Additionally there was shown an arterial vasoconstriction of the retina during acupuncture, which might be a reaction to dilation after onset of the acupuncture. The effect has to be proved in further studies with increased numbers of patients.

**P20**

**A ONE YEAR ANALYSIS OF LATANOPROST/TIMOLOL AND DORZOLAMIDE/TIMOLOL FIXED COMBINATIONS ON INTRAOCULAR PRESSURE, OCULAR HEMODYNAMICS AND VISUAL FUNCTION IN PATIENTS WITH OPEN-ANGLE GLAUCOMA**

I. Janulevicienė1, B. Siessky2, A. Harris1
1 Eye Clinic, Kaunas University of Medicine, Lithuania, 2 Glaucoma Research and Diagnostic Center, Indiana University School of Medicine, Indianapolis, IN, USA

Aims: To compare the effects of latanoprost/timolol (LTF) versus dorzolamide/timolol (DTF) fixed combinations on intraocular pressure (IOP), visual function and retrobulbar blood flow in patients with open-angle glaucoma (OAG).

Methods: 30 OAG patients (age 58.13 ± 8.60 years, 5 male) were evaluated in a prospective parallel randomized double-blind study. All patients received timolol for baseline evaluations. OAG patients were evaluated at baseline, 1, 6 and 12 months after LTF or DTF treatment. Measurements included adverse events check, arterial blood pressure, IOP, color Doppler imaging of the ophthalmic and central retinal and short posterior ciliary arteries, scanning laser polarimetry and Humphrey visual field examination.

Results: There were no statistically significant differences between baseline parameters for either treatment cohort. At 12 months IOP decreased by 5.0 mmHg in the DTFC cohort (p < 0.000) and 5.44 mmHg in LTF cohort (p = 0.0001). No statistically significant differences in visual field or nerve fiber layer parameters were observed in either treatment groups.
during 12 months therapy. After 12 month of combination treatment a mean increase in ocular perfusion and diastolic perfusion pressures was 12.3% and 10.7% in DTFC; 7.5% and 5.7% in LTFC cohort. Statistically significant changes in CRA resistive index were observed at 12 month visit (p < 0.05): decrease by -7.5% in DTFC group and increase by + 4.94% in LTFC cohort.

Conclusion: One year therapy of LTFC or DTFC treatment produces similar IOP lowering effects with stable visual function and structural parameters. DTFC showed lower vascular resistance in CRA while LTFC increased the vascular resistance of CRA. Twelve months of observation is likely too short a time period to see progressive visual field and/or nerve fiber layer defects.

**P21**

**ASSOCIATION BETWEEN OCULAR PULSE AMPLITUDE AND SEVERITY OF GLAUCOMATOUS DAMAGE**

M. Kynigopoulos1, T. Schlote2

1 Clinic Pallas, Olten, Switzerland, 2 Clinic Pallas, Olten, Switzerland

Purpose: To assess the relation between ocular pulse amplitude (OPA), as measured by dynamic contour tonometry (DCT, Pascal, Swiss Microtechnology) and structural and functional damage in patients with open angle glaucoma (OAG). Methods: Cross sectional, observational study. 240 eyes of 131 patients (mean age 70.6 ± 11.9 years) with open angle glaucoma (including primary OAG [146], normal tension glaucoma [37], pseudoexfoliative- [52], and pigmented glaucoma [5]) underwent Goldmann applanation tonometry (GAT), DCT, central corneal thickness (CCT) measurement and visual fields examination (Octopus, Haag Streit). Multiple regression analysis was used to analyze the effect of OPA, DCT, GAT and CCT on mean defect (MD) of the visual fields. Linear regression analysis was used to estimate the association between OPA and vertical cup to disc ratio (C/D).

Results: OPA was the only variable which showed a significant association with MD (R² = 0.06; Coefficient = -1.06, p = 0.0009) in contrast to GAT (p = 0.652), DCT (p = 0.334) and CCT (p = 0.502). OPA was also negatively associated with CDR (R² = 0.05, Coefficient = -1.787, p = 0.0003). Discussion: Decreased OPA seems to be correlated with more severe glaucomatous functional and structural damage. Assessment of OPA by DCT could therefore serve as an important additional parameter in management of glaucoma patients.

**P22**

**SPONTANEOUS AND FLICKER INDUCED DYNAMIC RETINAL VESSEL REACTION IN PRIMARY OPEN ANGLE GLAUCOMA**

I. Lanzl1, S. Seidova1, C.V. Düring2, K. Kotilar1

1 Technical University Munich, 2 Passau, Germany

Purpose: Impaired vascular regulation may contribute to glaucoma damage. We investigated if retinal arteries and veins of healthy persons and primary open angle glaucoma (POAG) patients show different dynamic behaviour and different reactions in response to flickering light. Methods: Vessel diameters of retinal vessel segments were assessed by Dynamic Vessel Analyzer (DVA) in 28 POAG patients (stage I, 54.3 ± 9.9 years old) after 4 week wash-out of eye drops and in 28 healthy volunteers. After baseline measurement (50 s) monochromatic rectangular flicker stimulation (530-600 nm, 12.5 Hz, 20 s) was applied 3 consecutive times. Mathematical and statistical data analysis independent from the commercial DVA program was performed. Baseline vessel reactions were analyzed for periodic pulsations using signal analyzing (1). Vessel diameter reaction was analyzed in its temporal sequence following the stimulus (2). Results: (1) We found a significant difference in low-frequency oscillations in arteries at baseline between both groups: mean period 3.6 ± 3.0 s in POAG and 7.7 ± 3.8 s in the control group (p < 0.05). In veins high-frequency oscillations show a significantly decreased periodicity in POAG vs. normals (p < 0.05; U-test). The rate of periodicity was 0.140 ± 0.100 and 0.255 ± 0.145 respectively. (2) In most subjects prompt vessel dilation in response to flicker and ensuing reactive arterial constriction were observed. No significant differences in arterial or venous dilation in response to stimulation were found between the groups. Reactive arterial constriction occurred later in the POAG group (49.9 ± 26.7 s vs. 25.5 ± 18.1 s; p < 0.01). Venous restoration occurred faster in POAG: area under the venous curve following the stimulation in POAG amounted to -1.1 ± 16.9 s% vs. 27.9 ± 34.3 s% in normals.

Conclusions: (1) Low-frequency oscillations with a period of 6-15 s reflect myogenic vasomotion and are well expressed in healthy seniors and almost absent in POAG. High-frequency changes in venous diameter corresponding to venous pulsation were decreased in POAG group. (2) Reactive arterial constriction following flicker stimulation appeared later and venous restoration occurred faster in POAG than in healthy controls. These findings in dynamic vessel behaviour (1) and the time course of vessel reaction to flicker (2) in POAG might be an indication for alterations in vessel wall rigidity (1), autonomous vessel regulation (1, 2) and vascular endothelial function (1, 2) in POAG.

**P23**

**RETINAL OXIMETRY IN GLAUCOMA PATIENTS USING A HYPERSPECTRAL CAMERA**

A. McNaught1, D. Mordant2, G. Muyo3, I. Alabboud3, P. Ritchie4, A. Harvey5

1 Gloucestershire Eye Unit and Cranfield University, United Kingdom, 2 Gloucestershire Eye Unit, United Kingdom, 3 Heriot Watt University, United Kingdom, 4 Dept of Anaesthetics, Gloucestershire Hospitals NHS Foundation Trust, United Kingdom

Purpose: Hyperspectral imaging offers a unique non-invasive technique to study retinal chrophosphores, such as the function-al haemoglobin derivatives, relevant to assessing the metabolic status of the retina. This study aims to establish the ability of hyperspectral imaging to detect oximetric changes in the retinal vasculature of patients with glaucoma using novel image processing and spectral analysis techniques.

Methods: A hyperspectral retinal imaging system consisting of a modified fundus camera, a tuneable filter and a low-noise CCD was used to capture sequential hyperspectral images of the human retina. A hyperspectral data cube with a spectral bandwidth of 500 nm to 700 nm obtained at wavelength steps of 2 nm were acquired for each subject. Normal subjects (n = 15) and patients with glaucomatous optic disc and visual field damage (n = 8) were examined. Reflectance image processing techniques, and a linear spectral unmixing algorithm were used to generate oximetric maps of the retinal vasculature.

Results: Linear spectral unmixing produced consistent semi-quantitative oximetric maps of the retina in normal subjects. In patients with glaucomatous damage, this technique detected consistent, and clinically significant, changes in oximetric oxygenation principally in the venular circulation of the retina. There is a suggestion that the increased level of oxygen satu-
ration evident in the retinal venules may be proportional to the extent of the associated visual field loss, and therefore, functioning ganglion cell mass.

Conclusions: The analysis of hyperspectral retinal images is capable of accurately detecting oximetric changes in the retinal vasculature. The oximetric changes in the venular circulation in the diseased retina suggests a reduced metabolic demand for oxygen in the retinal tissues, perhaps providing an objective measure of remaining (functional) ganglion cell mass. These techniques may ultimately be used to provide objective detection, and monitoring, of disease progression in patients with glaucoma. We also report on further developments to the technique which may allow more accurate quantitative estimates of oxygen saturation in retinal vessels to improve the precision, and clinical utility of these measurements.

P24

EFFICIENCY OF QUERCETIN IN TREATMENT OF THE EYE HEMO- AND HYDRODYNAMICS DISTURBANCES IN GLAUCOMA (EXPERIMENTAL STUDY)

I. Mykheitseva, L. Kashintseva
The Filatove Institute of Eye Diseases, Odessa, Ukraine

Purpose: to investigate ability of quercetin (Q) to improve blood supply and hydrodynamics of the eye in glaucoma model.

Methods: Q as a water-soluble form (2 mg/kg) was applied by fractional instillations of 0.5 ml 2% solution into the both eyes and intravenous injections to 25 rabbits with glaucoma model. The glaucoma was induced by chronic adrenal stress with intravenous injections of adrenalin (20 m kg/kg) for 3 months. There were examined single and daily repeated for 2 weeks combined administration of Q. IOP was measured by applanation tonometry, humor outflow facility (OF) and inflow (IF) - by electrotonography, blood filling of the choroid-ciliary vessels (BF) - by ophthalmo-rheography. Lipid peroxidation products (LPP), stable metabolites of nitric oxide were studied in blood by spectrophotometric methods before and after 2 weeks of Q treatment.

Results: Animals with glaucoma had high IOP, decreased OF, IF, BF. Level of LPP was elevated, NO metabolites were reduced. Single systemic using of Q increased BF by 41% (p < 0.01), instillations - by 62% (p < 0.01). Single action of Q did not show statistically significant changes of IOP, OF, IF. Two weeks combined administration of Q increased BF 2.1 times, improved eye hydrodynamics: increased OF by 57%, IF- by 52%, (p < 0.01), decreased IOP by 14% (p < 0.05). Examination of lipid peroxidation and NO- products after 2 weeks of Q treatment showed their stabilization.

Conclusion: Quercetin improved blood supply and hydrodynamics of the eye in rabbits with glaucoma model. The situation in the eye was accompanied with positive changes of oxidative stress and NO- related mechanisms in the body. These anti-ischemic, antioxidant, endothelioprotective and moderate hypotensive effects of Q, showed in experiment, open new perspectives for administration of bioflavanoids as alternative to some xenobiotics in glaucoma treatment.

P25

A COMPARISON OF THE EFFICACY AND SAFETY OF THE BIMATOPROST/TIMOLOL VERSUS LATANOPROST/TIMOLOL FIXED COMBINATIONS IN OPEN-ANGLE GLAUCOM PATIENTS

A. Martinez, M. Sanchez
Instituto Galego de Oftalmoloxia, Spain

Purpose: To assess the efficacy and safety of bimatoprost/timolol fixed combination (BTFC) versus latanoprost/timolol fixed combination (LTFC) given each evening over the 12-hour intraocular pressure (IOP) diurnal curve.

Methods: We designed a prospective, randomized, evaluator-masked, single center, crossover study. Our study included 54 eyes of 54 patients with open-angle glaucoma (OAG). Patients with an IOP of equal or higher than 19 mmHg, under treatment with prostaglandin analogues, were randomized to BTFC or LTFC for a 12-week treatment period after a 6-week run-in period on timolol maleate 0.5% (one drop in each eye twice each day). Patients were then switched to the opposite treatment for the second period. Six 12-hour IOP curves were recorded for each patient at baseline, week-6 and week-12, for each treatment period.

Results: The 12-hour IOP [mean (SD)] values were 22.0 (1.0) mmHg at baseline, 17.7 (0.8) mmHg on BTFC, and 18.5 (0.8) mmHg on LTFC (p < 0.0001). At individual time points there were a significant difference between groups at 8AM, 10 AM, 12 PM, 6 PM, and 8 PM with BTFC having greater ocular hypotensive effect, p < 0.001. The most frequently reported adverse event in the study was conjunctival hyperemia, which occurred in 40.7% (22/54) of patients of the BTFC treatment period and in 35.2% (19/54) of the patients in the LTFC treatment phase (p = 0.6619).

Conclusions: Both fixed combinations significantly reduced the 12-hour IOP from baseline in OAG. Nevertheless, the evening-dosed bimatoprost/timolol fixed combination provides better IOP control than that of latanoprost/timolol over 12 hours.

P26

VALIDATION OF OCULAR PERFUSION CHANGES IN NORMAL TENSION GLAUCOMA AND THEIR CONFRONTATION

E.A. Skoufis S, Georgaras, N. Varvayiannis
Ophthalmos Research and Therapeutic Institute, Hygeia Hospital Harvard Medical International, Athens, Greece

Purpose: To assess ocular blood flow (OBF) and hemodynamic parameters changes in NTG, and to evaluate medical strategy.

Method: In a retrospective study included 106 consecutive patients, mean age 50.5 ± 9, in follow-up 3 years (2003-6), divided in: GRA: control group 31 patients, 15 without glaucoma, CXT = 600 ± 13, 16 with POAG without treatment CXT = 585 ± 12; GRB: NTG group with 75 patients (47 F, 28 M), in four sub-groups: GRB1: NTG with no apparent vascular disorders (vd) 13, CXT = 540 ± 17 - GRB2: NTG with intraocular vD 20, CXT = 532 ± 15, 9 with disc hemorrhage (DH), 11 with peripapillary atrophy (PPA) - GRB3: with extraocular vD 27, CXT = 555 ± 14, 8 with essential hypotension (EH), 4 secondary hypotony (SH), 7 migrena, 5 with sleep apnea syndrome (SAS), 3 M. Raynaud - GRB4: NTG with combined vD15, CXT = 531 ± 10, 7 with DH and SAS, 8 PPA and EH. Paired T-test and linear regression used for statistical analysis. We performed a baseline glaucoma examination with monitoring pulsatile OBFA (PARADIGM), ocular perfusion pressure (OPP) and general examination MRI, CDUCA, Holter. Results: Our findings indicated that in NTG, OBF reduced to 49% with circadian fluctuations to 4.2 and mean decrease OPP = 40% from control group (p < 0.001) showed significantly vascular dysregulation. Reduction of OBF 27%, OPP = 30% in GB1 related with vasospasm phenomenon. In GB2 to GB4 OBF and OPP were very sensible and fluctuated depending on the intra or extraocular disorders, CCT and IOP changes (p = 0.001), showed the abnormality autoregulation. In GB2 with DH, GB3 with SAS and SH, the OBF and OPP were lower ≥ 5% than other subgroups (p < 0.001), Latanoprost with IOP reduction from baseline 30.8%, BFA improved 16.6%, OPP increased 22% was the best as monotherapy in GB1. In GB2 and GB3 the switch therapy
and rate of complications were less in the first group.

Conclusions: We found no differences in visual acuity or IOP control between uneventful phaco-DS and phaco-DS reconverted. However, both number of drugs needed to control IOP and rate of complications were less in the first group.

Poster Session 4

**COMBINED GLAUCOMA SURGERY AND PHACOEMULSIFICATION**

**P27**

**PHACO-DEEP SCLERECTOMY COMPARED WITH PHACO-DEEP SCLERECTOMY RECONVERTED INTO PHACO-TRABECULECTOMY**

Glaucoma-Unit, Hospital Ramón y Cajal, Universidad de Alcalá, Madrid, Spain

Purpose: To evaluate and compare the results and complications between uneventful phaco-deep sclerectomy (phaco-DS) in one eye and phaco-DS converted into phaco-trabeculectomy in the other eye of the same patient.

Methods: We analysed 32 eyes of 16 patients having a planned bilateral phaco-DS, although one eye had to be converted into phaco-trabeculectomy due to a large perforation during the nonpenetrating procedure. Visual acuity, slit-lamp examinations, intraocular pressure (IOP) and number of glaucoma medications were evaluated preoperatively, and on 1 and 7 days, and 1, 3, 6, 12, 18 and 24 months postoperatively. Complications also were recorded. Comparisons between groups were performed and success probability analysis was made using the Kaplan-Meier survival curve.

Results: The mean follow-up period was 16.5 months (range 7 to 23 months). Postoperative visual acuity improved in 12 eyes (80%) and remained the same in 3 eyes (20%). The IOP was reduced significantly from 25.0 ± 5.04 mmHg (mean ± SD) preoperatively to 16.8 ± 3.61 mmHg (mean ± SD) postoperatively at last follow-up visit (p < 0.001). The number of anti-glaucoma medications was also reduced significantly from 3.4 ± 0.63 (mean ± SD) preoperatively to 1.33 ± 1.11 (mean ± SD) at last follow-up (p < 0.001). Five eyes (33.3%) achieved complete success with IOP ≤ 21 mmHg without anti-glaucoma medications and 13 eyes (86.7%) achieved qualified success with IOP ≤21 mmHg without medication or with a reduction in the number of medication(s) at the last follow-up visit. There were 2 failure defined as uncontrolled IOP requiring anti-glaucoma medications, without a reduction in the total number of eye drops. There was no intra-operative complication noted in this case series. The postoperative course was similar to routine phacoemulsification with intraocular lens implantation alone.

Conclusion: Combined phacoemulsification intraocular lens implantation plus endoscopic cyclophotocoagulation was a simple, safe, and effective means of controlling intraocular pressure (IOP) for patients with both open and closed angle glaucoma with coexisting cataract.

**P28**

**LONG-TERM RESULTS OF COMBINED CATARACT EXTRACTION WITH INTRAOCULAR LENS IMPLANTATION AND ENDOSCOPIC CYCLOPHOTOCOAGULATION IN ASIAN PATIENTS WITH COEXISTING CATARACT AND GLAUCOMA**

O. Chan, N. Yuen
Tung Wah Eastern Hospital, Lo Ka Chow Ophthalmic Center, Hong Kong

Purpose: To evaluate the immediate and long term effect of endoscopic cyclophotocoagulation plus phacoemulsification with intraocular lens implantation on intraocular pressure in Asian patients with glaucoma and coexisting cataract.

Method: This is a prospective interventional case series of 15 patients who had either opened or closed angle glaucoma with coexisting cataract. These 15 patients, recruited between November 2005 and May 2007, had undergone combined phacoemulsification intraocular lens implantation plus endoscopic cyclophotocoagulation. The visual acuity, intraocular pressure (IOP), number of anti-glaucoma medications and complications were analyzed.

Results: The mean follow-up period was 16.5 months (range 7 to 23 months). Postoperative visual acuity improved in 12 eyes (80%) and remained the same in 3 eyes (20%). The IOP was reduced significantly from 25.0 ± 5.04 mmHg (mean ± SD) preoperatively to 16.8 ± 3.61 mmHg (mean ± SD) postoperatively at last follow-up visit (p < 0.001). The number of anti-glaucoma medications was also reduced significantly from 3.4 ± 0.63 (mean ± SD) preoperatively to 1.33 ± 1.11 (mean ± SD) at last follow-up (p < 0.001). Five eyes (33.3%) achieved complete success with IOP ≤ 21 mmHg without anti-glaucoma medications and 13 eyes (86.7%) achieved qualified success with IOP ≤21 mmHg without medication or with a reduction in the number of medication(s) at the last follow-up visit. There were 2 failure defined as uncontrolled IOP requiring anti-glaucoma medications, without a reduction in the total number of eye drops. There was no intra-operative complication noted in this case series. The postoperative course was similar to routine phacoemulsification with intraocular lens implantation alone.

Conclusion: Combined phacoemulsification intraocular lens implantation plus endoscopic cyclophotocoagulation (ECP) is a simple, safe, and effective means of controlling intraocular pressure (IOP) for patients with both open and closed angle glaucoma with coexisting cataract.

**P29**

**COMBINED TREATMENT GLAUCOMA AND CATARACT IN EYE WITH PSEUDOXEFOLIATION SYNDROME**

N. Fatulloeva, V. Nereov, Z. Isakova, A. Bessmertny, O. Kiseleva
Moscow Helmholtz Research Institute of Eye Diseases, Moscow, Russia

Purpose: To estimate the efficacy combined interference – phacoemulsification, IOL implantation, fistulizing operation in glaucoma patients with pseudoexfoliation syndrome (PEX).

Methods: Interference was performed in 22 patients (22 eyes) with PEX. The following technique was used. After limbus-based conjunctival flap prepared, limbus-based T-shape scleral flap approximately half of the thickness of sclera dissected, two vertical scleral incision and cyclodialysis in horizontal part of scleral bed performed, scleral block containing Schlemm’s canal existed, ends of the horizontal part of the scleral flap is tucked in cyclodialysis slots. Then temporal clear corneal standard phacoemulsification was performed and foldable single-piece hydrophobic acrylic foldable was im-
planted into the capsular bags. A capsular tension ring was implanted in 7 eyes with zonular weakness.

Results: No serious intraoperative and early postoperative complications were observed. Satisfactory IOP control was maintained in all cases (in 3 cases with additional hypotensive medications) with average follow-up of 8.9 months (range, 6-14 months). Mean antiglaucoma medication preoperative was 1.6 and was reduced to 0.18 postoperative.

Visual acuity improved to 20/40 or better in 20 eyes. Two eyes had low visual function from glaucoma damage.

Conclusions: According to the present study, the given above technique seems a safe and effective for the treatment glaucoma and cataract in patients with PEX.

**P30**

**PHEROCODEEPSCLERECTOMY WITH IMPLANT SK-GEL OR T-FLUX - 24 MONTHS OBSERVATION**

K. Lewczuk, M. Rękas, A. Siemiątkowska, A. Stankiewicz

The Departament of Ophthalmology, Military Health Service Institute in Warsaw, Poland

Purpose: To evaluate the effectiveness and safety of phacodeep sclerectomy with implant SK-gel or T-flux based on 24 months observation.

Materials and methods: Retrospective analysis included group I (SK-gel) -32 eyes and group II (T-flux) - 20 eyes. The indication was uncontrolled POAG and coexistent cataract. DBC-VA, IOP, anterior and posterior segment of the eye and number of medications were examined. Control was done in 1 and 7 day and 1, 3, 6, 12, 18 and 24 months. Complete success rate was defined as IOP ≤ 18 mmHg without medications and qualified as IOP ≤ 18 mmHg with and without medications. In statistical analysis U Mann-Whitney’s test, t-Student’s test, pair sequence Wilcoxon’s test and variance analysis were used. Survival analysis was done with Kaplan-Meier.

Results: After 720 days of observation mean values of IOP in the SK-gel group was 13.8 ± 0.5 (SE) mmHg and in T-flux group 14.1 ± 0.5 (SE) mmHg. It was a decrease in the mean IOP by 34.0% (p = .000) and 33.2% (p = .000) respectively to the values before surgery in particular groups. There was no statistical significance between the usages of medications in both studied groups at the end. Complete and qualified surgical success rate was reached respectively in group I (69.8% and 93.2%) and in group II (61.3% and 84.1%). In the entire observation period there was no statistically significant difference between groups I and II in complete success rate (p >.05), but in qualified success rate the differences were statistically significant (p <.05). There was no statistically significant difference between character and quantity of complications in studied groups.

Conclusions: Phacodeep sclerectomy with absorbable implant Sk-gel is more effective than phacoemulsification with non-absorbable implant T-Flux because of remote results.

**P31**

**MICROCOAXIAL CATARACT PHACOEMULSIFICATION ON THE EYES WITH COMPENSATED AND OPERATED GLAUCOMA**

S. Nikolashin, V. Machekhin

Sv. Fyodorov Eye Microsurgery Complex, Tambov Branch, Tambov, Russia

Purpose: To conduct comparative characteristic of procedure technique and results of microcoaxial and customary cataract phacoemulsification on the eyes with operated and compensated glaucoma and cataract.

Methods: In the first group we observed 39 eyes with compensated glaucoma, which underwent coaxial phacoemulsification with 2.75 mm incision. Preoperative visual acuity with correction was 0.08. In the second group we observed 27 eyes with compensated glaucoma, which underwent microcoaxial phacoemulsification with 2.2 mm incision. Preoperative visual acuity was 0.07. Surgical operation was done with “Legacy 20000 Everest” device; “Tapered Kelman ABS” ultrasound needle, 0.9 mm in diameter was used in both groups; microsleeve was used in the first group, and ultrasound “Microsmooth” was used in the second group.

Results: There were no complications during the surgery. During postoperative period the first group had one case of postoperative uveitis, which was managed by conservative treatment. 18 eyes had hypertension during the first postoperative day. The second group had no cases of inflammatory complications. Hypertension was found in 12 eyes and was managed with medications. Visual acuity after one month of observation was 0.51 in the first group, and 0.6 in the second group. Induced astigmatism averaged at 0.19 D after microcoaxial phaco, and at 0.58 D after standard coaxial phaco with 2.75 mm incision.

Conclusions: 1. Microcoaxial cataract phacoemulsification through 2.2 mm incision on the eyes with compensated and operated glaucoma and cataract which uses ultrasound “Microsmooth” and “Tapered Kelman ABS” needle manufactured by “Alcon” and which is performed with “Legacy - 20000 Everest” device is effective, safe, and gives good functional results. 2. The extent of induced astigmatism after microcoaxial phacoemulsification was considerably smaller in comparison with coaxial phacoemulsification with 2.75 mm and averaged at 0.19 D, and during coaxial phaco it was 0.58 D.

**P32**

**TRABECTOME AND PHACOEMULSIFICATION: A NOVEL TECHNIQUE OF COMBINED GLAUCOMA AND CATARACT SURGERY**

S. Vold1, B. Francis2, D. Minckler3

1 Boozman-Hof Regional Eye Clinic, Rogers, Arkansas, USA,
2 Doheny Eye Institute, Keck School of Medicine, USC, Los Angeles, California, USA, 3 UC Irvine Ophthalmology, Irvine, California, USA

Objective/Purpose: To report the clinical results and safety of combined Trabectome (NeoMedix Corp., Tustin, CA) and phacoemulsification in patients with both visually-significant cataract and open-angle glaucoma from the Trabectome Study Group.

Methods: This is a prospective, non-randomized study of consecutive cases of combined Trabectome and phacoemulsification surgery with a period of 21 months follow-up. All cases performed by the participating surgeons were included. Baseline demographic and medical data were collected. The Trabectome surgical procedure utilizes a thermal microcautery unit to unroof Schlemm’s canal and expose the collector channels to aqueous humor and the anterior chamber. Phacoemulsification was performed following the Trabectome procedure. The main outcome measures were intraocular pressure (IOP), number of glaucoma medications, and the occurrence of complications or secondary procedures.

Results: A total of 304 consecutive patients with primary open-angle glaucoma (71%), pseudoexfoliation (10%), steroid-induced (2%), uveitic (2%), pigment dispersion (2%), and other types of open-angle glaucomas (13%) with varying severity of disease were included. One hundred sixteen (38%) patients were categorized as having advanced glaucomatous optic nerve damage. All patients had visually-significant cataracts. At baseline, the mean age was 75 years, pre-operative IOP was 20.0 ± 6.3 mmHg and patients were using 2.7 medications. Patients were predominantly Caucasian (79%)
Results: Of 974 subjects who received at least ≥ 1 drop of latanoprost (FCLT) in patients requiring additional IOP reduction over 5 years. Methods: This open-label, phase 3b, multicenter safety study included subjects with OAG/OH insufficiently responsive to ß-blockers and who required additional IOP reduction.

Conclusions: The Trabectome minimally invasive procedure is a safe and effective way to lower IOP in both adult and pediatric patients with open-angle glaucomas. It is suitable as both an independent modality or in combination with phacoemulsification cataract surgery.

Poster Session 5

COMPLICATIONS ARISING FROM MANAGEMENT - MEDICAL / SURGERY / LASER

P33 FIXED-COMBINATION LATANOPROST/TIMOLOL (XALACOM) FOR OPEN-ANGLE GLAUCOMA (OAG) AND OCULAR HYPERTENSION (OH): RESULTS OF A 5-YEAR, MULTICENTER SAFETY STUDY

A. Alm1, J.W. Grunden1, K.K. Kwok2
1 Uppsala University, Sweden, 2 Pfizer Inc

Purpose: To study the safety of fixed-combination latanoprost/timolol (FCLT) in patients requiring additional intraocular pressure (IOP) reduction over 5 years.

Methods: This open-label, phase 3b, multicenter safety study of FCLT included subjects with OAG/OH insufficiently responsive to ß-blockers and who required additional IOP reduction. Subjects at least 18 years of age with OAG/OH and who were prostaglandin naive were evaluated at 6-monthly visits.

Safety endpoints were the following: incidence of overall increased iris pigmentation (OIIP; development of ≥ 1 grade of IIP up to and including month 60) from baseline; changes in periorbital skin or eyelashes; and occurrence of ocular/periorbital adverse events (AEs) and of serious AEs (SAEs). IOP was measured every 6 months as a safety measure in this study. A masked reader assessed IIP and changes in eyelash lengths from iris and en face photographs (IRIS system) taken at baseline and at years 1, 3, and 5; changes were evaluated by subjects and investigators at each visit. The incidence of OIIP was compared to that of historical control from a similarly designed 5 year latanoprost study (Alm A, et al. Arch Ophthalmol 2004; 122: 957-65).

Results: Of 974 subjects who received at least ≥ 1 drop of FCLT (analysis population), 233 (23.9%) developed OIIP (595 (61.1%) had no OIIP (ONIIP), and 146 (15.0%) had no/incomplete IRIS photo data; a total of 525 (53.9%) subjects completed the 5-year study. Subjects with OIIP were highly likely to have mixed eye color (85.8%). In the OIIP and ONIIP groups, respectively, similar percentages had at least 1 AE, discontinued due to an AE, and had at least 1 SAE (64.8% vs. 64.4%; 7.3% vs. 10.4%; 17.2% vs. 13.3%). FCLT-related SAEs were rare. The maximum grade of OIIP was generally stable from months 12 to 60 and was classified as “weak.” The IRIS system judged a higher percentage of subjects developed OIIP than did investigators or subjects (23.9% vs. 10.7% vs. 5.7%). At baseline, mean (SD) IOP was 21.0 (3.4) mmHg for all 974 subjects. Mean IOP reduction varied only slightly over 5 years (5-year mean reduction: -4.0 ± 4.2 mmHg). After 60 months, 233/828 (28.1%) evaluable subjects developed OIIP compared to 127/380 (33.4%) historical control, a difference that could be due to differences in study procedures.

Conclusion: FCLT is safe and well tolerated for long-term OAG/OH treatment.

P34 TWO YEAR SAFETY ANALYSIS OF LATANOPROST TREATMENT IN OCULAR HYPERTENSIVE PATIENTS

J. Bacharach1, C. Tressler1, K. Kwok2, E. Kim3
1 North Bay Eye Associates, 2 Pfizer Inc, USA

Purpose: Conduct ocular and systemic safety analyses of 2 year internet registry data for ocular hypertensive patients treated with latanoprost 0.005%.

Methods: A database was created in order to register and track patients with ocular hypertension in the United States. This web-based registry examined the use of latanoprost in a population-based clinical practice setting. Physicians were able to enter and view graphic displays of their patients’ data via the website. Patients received treatment with latanoprost 0.005% solution every drop either as monotherapy or in combination with other IOP-lowering medications for a period of two years according to routine medical practice. Patients who discontinued or switched to other medications continued to be followed in the registry. All adverse events directly reported by the physician and all adverse events spontaneously reported by the patient were reported. Results: 976 patients on latanoprost monotherapy were enrolled in the study. The most frequently reported adverse events (experienced by greater than 3% of patients) were iris color change (21.7%), eyelash change (14.6%), red eye (6.1%), burning/itching (4.9%), itching (4.7%) and eyelid skin darkening (3.8%). Eight patients experienced serious systemic adverse events and these were not considered to be related to study drug.

Conclusion: Latanoprost was well tolerated in ocular hypertensive patients. The most commonly reported adverse events in this study were consistent with the known adverse events. The incidence of serious systemic adverse events was low and none were considered to be treatment-related.

P35 GLAUCOMA IN EYES AFTER DESCEMET STRIPPING ENDOTHELIAL KERAToplasty

E. Wylegala1, D. Dobrowolski1, D. Tanawska2, D. Janiszewska2
1 Department of Nursing and Social Medical Issues, Silesian Medical University, Katowice, Poland, 2 Department of Ophthalmology, District Railway Hospital, Katowice, Poland

Purpose: To evaluate cases of glaucoma in eyes after Descemet Stripping Endothelial Keratoplasty (DSEK). Methods: 165 procedures of DSEK in 165 eyes were performed for corneal edema or Fuchs dystrophy between 2004 and January 2008. For the study 164 patients were qualified: 103 women and 61 men, mean age 63.1 ± 13.6 years. Follow-up post DSEK was 17.6 ± 6.2 months. 123 eyes were pseudophakic, 34 procedures were combined with cataract phacoemulsification with IOL implantation, 5 eyes were aphakic, 3 secondary implantations was made, in 2 cases transcleral fixation was acquired. Preoperative glaucoma was noted in 37 eyes. IOP was evaluated in all cases. Requirements of topical management of glaucoma was analyzed. Visual field, optic nerve fibres layer thickness, optic nerve head parameters in glaucoma patients were evaluated with OCT. Results: New glaucoma diagnosis occurred in 8 eyes. Patients
treated before surgery only in 4 cases required additional topical treatment. The response for topical treatment was satisfactory, no one required surgical management. Visual field, optic nerve fibres layer thickness analysis, optic nerve head parameters did not show progression after DSEK procedure.

Conclusions: DSEK is a safe method of treatment, which does not increase risk of postoperative glaucoma development and progression.

**P36**

**CORNEAL SAFETY OF GLAUCOMA MEDICATIONS IN A HUMAN STUDY**

I. Goldberg1, M.B. Sultan2, D. Zhou1, L. Hwang1, E. Kim1, J.W. Grunder1, C.S. Tressler2

1 University of Sydney, Australia, 2 Pfizer Inc., USA

Purpose: To determine the frequency of occurrence of corneal erosions with latanoprost as compared with their frequency during treatment with other glaucoma medications.

Methods: This was a 5 year, multinational, open-label, randomized, post marketing safety surveillance study to compare latanoprost, administered once daily, with any commercially available intraocular pressure (IOP) reducing medication, excluding latanoprost. Once subjects were randomized, investigators were at liberty to select any additional IOP reducing agent(s) to control IOP. Patients were examined at baseline and every six months for the duration of the study. At each visit, the investigator performed a complete routine ophthalmologic examination of both eyes, including slit-lamp examination, ophthalmoscopy, and measurement of IOP with a Goldmann applanation tonometer.

Results: Originally, 6000 patients were planned for randomization in a 2:1 ratio (latanoprost:other IOP lower agent). 5893 patients were randomized (3936 to latanoprost and 1918 to other IOP lowering agents, 39 were randomized but never treated). Punctate corneal epithelial erosions were considered to be mild, transient and within normal range of findings in eyes treated with topical eye drops and were not recorded as corneal erosions. Only corneal erosions of a more severe nature were noted. New occurrences of corneal erosions were noted to be 2.7% or less in the latanoprost group and the other IOP lower agents group. Medication discontinuation was less than 0.8% in both groups.

Conclusions: This 5-year safety surveillance study of 5854 patients at 406 study centers in 14 countries indicate that latanoprost, as prescribed in clinical practices worldwide is a safe long-term treatment for patients with glaucoma. Based on the incidence of corneal erosions (< 2.7%) among patient groups, there are no new corneal safety concerns in this human study. Adding latanoprost to the treatment regimen of patients receiving multiple medications did not increase the risk of developing new corneal erosions.

**P37**

**PUNCTATE EPITHELIAL EROSIONS (PEE): INCIDENCE IN DOUBLE-MAKED, PROSPECTIVE, CONTROLLED TRIALS OF LATANOPROST AND TIMOLOL**

L. Hwang, G.W. Bean, J.M. Fain, M.B. Sultan, E. Kim, J. Grunder, C.S. Tressler

Pfizer Inc., USA

Purpose: To evaluate whether doubling the amount of benzalkonium chloride (BAK) in latanoprost-treated patients was associated with an increased incidence of PEE in studies that compared latanoprost versus timolol therapy in patients with glaucoma or ocular hypertension.

Methods: A meta-analysis of the double-masked phases of 6 prospective, controlled clinical trials was conducted to compare the incidence of PEE in glaucoma or ocular hypertension patients treated with latanoprost or timolol. In 5 of the 6 trials, timolol maleate (0.01% BAK) was administered twice daily and latanoprost (0.02% BAK) was administered once daily with vehicle (0.01% or 0.02% BAK) administered once daily; in the remaining study, both drugs were dosed once daily. The analysis included all patients reporting PEE either as an adverse event or a finding.

Results: In all, 1658 patients were enrolled in the double-masked portion of the trials (latanoprost, n = 874; timolol, n = 784). The overall incidence of PEE was 6.4%; the incidence in latanoprost-treated patients was 6.6% and was 6.1% in timolol-treated patients. The combined risk difference of latanoprost - timolol was 0.008 (95% CI: -0.015, 0.031; p = 0.495), and the combined odds ratio for PEE of latanoprost versus timolol was 1.114 (95% CI: 0.726, 1.710; p = 0.620). The amount of BAK was approximately twice as great in the latanoprost arm as in the timolol arm.

Conclusions: The incidence of PEE was similar and not statistically significantly different in latanoprost- versus timolol-treated patients. Doubling the amount of BAK in the latanoprost-treated patients was not associated with an increased incidence of PEE.

**P38**

**PROGNOSIS OF FUNCTIONAL DAMAGE PROGRESSION IN PATIENTS WITH ADVANCED GLAUCOMA DEPENDING ON DIFFERENT STRATEGIES OF TREATMENT**

J. Izdebska, A. Zaleska-Zmijewska, M. Szymańska, J. Szaflik

Department of Ophthalmology Medical University of Warsaw, Poland

The aim of the study was to evaluate the influence of different types of treatment in patients with advanced glaucoma on the stability of functional changes due to neuropathy.

The study groups. All patients included to the study were divided into two groups: 1. group - 55 patients medically treated with 3 or more antiglaucomatous drops. 2. group - 64 patients after filtering surgery [as a single procedure in 24 patients (37.5%) and combined with phacoemulsification in 40 patients (62.5%)]. The following parameters were evaluated on the beginning and the end of the study: visual acuity, IOP, MD and PSD parameters of visual field (HFA) and the number of drops applied. The follow up period was 12 months.

Results: Visual acuity was decreased in 21% of patients in 1. group and 17% in 2. group. The decrease of VA was partially caused by cataract progression. MD and PSD parameters were stable in the 2. group and slight but statistically significant progression was observed in the 1. group. The average number of drops used by patients in the 1. group was 3.6 (from 2 to 4) and in the 2. group - 1.7 (from 0 to 2).

Conclusions: 1. Filtering surgery is effective and safe method of lowering IOP in patients in advanced glaucoma. 2. VF parameters are stable after surgical treatment in patients with advanced glaucoma at one year. 3. Statistically less antiglaucomatous medications were used in the group of patients who underwent filtering surgery.

**P39**

**IDIOPATHIC SCLEROCHOROIDAL CALCIFICATION IN PRIMARY OPEN ANGLE GLAUCOMA, IS IT TIMOLOL INDUCED?**

R. Job, T. Elkashab, A. Needham

Leighton Hospital, Crewe, United Kingdom

Sclerochoroidal calcification is an ocular condition that is characterised by multifocal, yellow-white fundus lesions. Most cases are idiopathic, however it can be associated with sys-
temic conditions which cause changes in calcium and phosphorous metabolism.

Purpose: To report sclerochoroidal calcification in two patients with primary open angle glaucoma on treatment with Timolol.

Methods: This is a observational case report of two patients with POAG who were on treatment with Timolol for a few years and the was found to have yellowish white lesions on the superotemporal fundus. Ultrasonography showed sclerochoroidal calcification, there was no abnormality with calcium-phosphorus metabolism and no associated systemic causes for calcification.

Discussion & Conclusion: Many of the eye drops including timolol preparations contain high levels of phosphates as part of buffer system. There are reports of high concentrations of phosphates causing calcification in presence of epithelial keratoathy on the cornea. We postulate that sclerochoroidal calcification noticed after many years of timolol therapy is the same process of calcification on sclera and choroid as on the cornea, but more studies or case reports are required to prove this assumption.

P40 INCIDENCE OF OCULAR IRITATION WITH A TOPICAL PROSTAGLANDIN ANALOGUE FROM A REGISTRY STUDY

E. Kim, K. Kwok, C.S. Tressler, M.B. Sultan, J.W. Gunden,
G.W. Bean

Pfizer Inc., USA

Purpose: To evaluate the incidence of ocular irritation among latanoprost-treated patients using data from a large internet registry.

Methods: A nationwide internet database was developed to register and track patients with ocular hypertension who have been treated for two years with latanoprost. The current analysis included 1205 patients from 71 U.S. centers; 976 (81%) received latanoprost as monotherapy, and 229 (19%) received latanoprost as part of combination therapy. The incidence of ocular irritation, defined as burning/itching or allergic reaction, was calculated.

Results: Among the 1205 enrolled patients, the overall incidence of burning/itching in the latanoprost monotherapy group was 4.9% and was 6.1% in the combination therapy group. The incidence of allergic reactions was 0.4% in the monotherapy group and 1.3% among those receiving latanoprost as part of combination therapy.

Conclusions: Data from a large internet registry demonstrate that the incidence of ocular irritation (burning/itching or allergic reactions) with latanoprost is low whether latanoprost is administered as monotherapy or in combination with other therapies.

P41 INTRAOCULAR PRESSURE MODIFICATIONS FOLLOWING THE USE OF SILICON OIL OR DENSIRON-68 AS ENDOTAMPOONADE IN PARS PLANA VITRECTOMY

M.R. Romano1, M. Angi1, F. Parmeggiani2, C. Campa1, X. Valdeluperas3, C. Costagliola3

1 St Paul’s Eye Unit, Royal Liverpool University Hospital
Prescott Street, Liverpool L7 8XP, United Kingdom, 2 Department of Ophthalmology, University of Ferrara, Ferrara, Italy, 3 Department of Health Sciences, University of Molise, Campobasso, Italy

Purpose: To compare the effects of Silicon Oil 5700 cts (SO) and Densiron-68, tamponade agents for the treatment of complicated retinal detachment, on intraocular pressures (IOP).

Methods: retrospective case series including 180 eyes of 180 patients, 105 eyes treated with SO and 75 eyes with Densiron-68. Both groups were matched for preoperative comorbidities (diabetes, glaucoma, phakic status, and refractive errors). Intraocular pressure was measured before surgery, 1 day after surgery, and then at 1, 3, 6, 9, 12, months follow-up. Silicon Oil and Densiron-68 removal were planned within 6 (170 ± 45 days) and 3 months (142 ± 81 days), respectively, from the initial surgery. The following preoperative and postoperative parameters were recorded: aetiology of retinal detachment, refractive status, pre-existing glaucoma, lens status, diabetes mellitus, presence of SO in the anterior chamber, emulsification of SO and ruberosis iridis. The presence of glaucoma was defined as postoperatively persistent elevated IOP greater than 25 mmHg, or with a value greater than 10 mmHg above the preoperative level.

Results: Glaucoma occurred in 14% of the eyes (15 out of 105) at 1 day postoperatively and persisted in 12 % of the eyes (13 out of 105) at 1 month follow-up in presence of SO. In Densiron-68 group glaucoma occurred in 20% of the eyes (15 out of 75) at 1 day postoperatively and persisted in 18% of the eyes (9 out of 75) at 1 month follow-up. The differences between the two groups, were always not significant (chi square test). Glaucoma was controlled in 12 of 15 eyes (81%) (45% with topical treatment, 30% with oral treatment, 6% others surgical procedures) in SO group and in 11 of 15 (73%) (40% with topical treatment, 20% with oral treatment, 13% others surgical procedures) in Densiron-68 group. At 12 months follow-up the mean IOP was 16.7 ± 8.7 mmHg and 19.7 ± 3.8, respectively in SO and Densiron-68 group. The IOP difference between the two groups was not statistically significant (p = 0.21, chi square test). At this time we still report 8.2 % of the patient (7 out of 85) in SO group and 16 % of the patient (11 out of 68) in Densiron-68 group on topical treatment for glaucoma.

Conclusion: The use of Densiron-68 was associated with a higher IOP as compared to SO both in the early postoperative period and at long term follow-up. A high IOP value on the first postoperative day represents a prognostic negative risk factors for the glaucoma development in long term follow-up. In most cases the topical treatment is sufficient to keep the pressure under control. Prophylactic treatment should be considered in high-risk eyes. Elevation of IOP could be attributed directly to the endotamponade agents in all cases. The raised IOP in Densiron-68 group was more difficult to treat than that occurring in SO patients.

P42 EVALUATION OF THE RISK OF VISUAL FIELD LOSS AFTER FILTERING SURGERY IN THE END-STAGE GLAUCOMA

A. Zaleska-Zmijewska, J. Izdebska, M. Udziela, J. Szaflik
Department of Ophthalmology Medical University of Warsaw, Poland

Purpose: To report sclerochoroidal calcification in two patients with primary open angle glaucoma on treatment with Timolol.

Aim of the study was a retrospective analysis of filtering surgery outcomes in end-staged glaucomas. Medical history of 64 patients who underwent trabeculectomy or phacotrabeculectomy in 2006 year were analysed. Patients mean age was 67.9 year (min. 39-max. 87).

Main outcome measures: 1. pre and 6 months postoperative Visual acuity (VA); 2. intraocular pressure pre, and postoperative at 1 day 3 months and 6 months; 3. visual field testing (parameters MD and PSD) in 6 months follow-up; 4. early postoperative complications.

Results: 24 patients underwent trabeculectomy (37.5%) and 40 phacotrabeculectomy (62.5%). In all patients in study groups the IOP was low at the 3 and 6 months follow-up periods and was comparable in both groups. There were no changes in MD and PSD parameters in HFA perimetry 6 months after surgery in both groups. Decrease of mean VA was observed in 42% of patients 6 months after trabeculectomy, what was probably connected with cataract progression. Early postoperative complications due to great IOP decrease
and hyperfiltration occurred with double frequency in the group of patients who underwent trabeculectomy. In the group of patients after phacotrabeculectomy, the main postoperative complications were of inflammatory origin.

Conclusions: 1. Filtering surgery is an effective method of lowering IOP in patients in advanced glaucoma. 2. Trabeculectomy and phacotrabeculectomy are safe procedures even for patients with very advanced visual field defects, without progression in MD and PSD parameters.

Poster Session 6

DRAINAGE TUBES

P43
GLAUCOMA MANAGEMENT WITH AHMED VALVE IN EYES AFTER PENETRATING KERATOPLASTY
D. Tarnawska1, E. Wylegala2, D. Dobrowolski1, S. Teper1, J. Pilat1
1 Department of Ophthalmology, District Railway Hospital, Katowice, Poland, 2 Department of Nursing and Social Medical Issues, Silesian Medical University, Katowice, Poland

Purpose: To evaluate efficacy of Ahmed valve implantation in eyes after penetrating keratoplasty (PK).

Methods: 11 procedures of Ahmed valve implantation performed for complicated glaucoma between 2002 and 2007 were analyzed. For the study 19 patients were qualified: 11 women and 8 men, mean age 54.4 ± 22.5 years. Follow-up post PK was 23.3 ± 14.7 months (range 4 - 51 months). 17 eyes were pseudophakic, 2 eye was aphakic. Preoperative glaucoma treatment has not stopped disease progression. Postoperative IOP was evaluated in all cases. Visual field, optic nerve fibres layer thickness, optic nerve head parameters were evaluated with OCT.

Results: Mean IOP 3 months after surgery was 17.1 ± 7.7 mmHg. In 5 eyes (26.3%) IOP was stable - below 21 mmHg. 7 patients (36.8%) required one additional topical drug, 5 patients (26.3%) used 2 topical drugs. Progression was noted in 3 eyes (15.7%) with IOP over 30 mmHg. In 3 eyes (15.7%) graft decompensation occurred after implantation of Ahmed valve due to increased IOP and graft rejection. Rejection treatment improved corneal transparency in 2 eyes (10.5%). BCVA ranged from light perception to 0.2. Visual field, optic nerve fibres layer thickness analysis, optic nerve head parameters analysis were performed in 16 eyes (84.2%) - patients with transparent corneal, progression was noted in 3 eyes (15.7%) with unstable IOP.

Conclusions: Ahmed valve implantation can be an effective method of IOP control after PK, however increases risk of rejection.

P44
OUTCOME OF INTRAVITREAL BEVACIZUMAB (AVASTIN) FOLLOWED BY AQUEOUS SHUNTING TUBE SURGERY FOR MANAGEMENT OF INTRACTABLE NEOVASCULAR GLAUCOMA
T. Eid1, A. Radwan2, I. El-Hawy3, W. El-Manawy4
1 Associate Professor & Chief, Glaucoma & Cataract Unit, Magrabi Eye & Ear Center, Jeddah, Saudi Arabia, 2 Consultant, Vitreoretina Unit, Magrabi Eye & Ear Center, Jeddah, Saudi Arabia, 3 Associate Consultant, Glaucoma & Cataract Unit, Magrabi Eye & Ear Center, Jeddah, Saudi Arabia

Purpose: To study safety and efficacy of intravitreal Bevacizumab (IVB) injection followed by aqueous shunting tube (AST) surgery for management of neovascular glaucoma (NVG) with intractable high IOP.

Methods: Twenty-five eyes of 25 patients with NVG and high intraocular pressure (IOP) not responsive to maximally tolerated topical and systemic antiglaucoma medications were treated with ASTS (mainly Ahmed valve). Patients were classified into two groups; Group 1 (14 eyes) received IVB (1.25 mg/ 0.05 ml) before AST surgery (IVB-AST group). These eyes had severe retinopathy, florid NVI, dense cataract, or corneal edema that prevented proper PRP treatment before glaucoma surgery. Group 2 (11 eyes) was treated by PRP first (due to media clarity) then ASTS was performed without injection of IVB (PRP-AST group). Main outcome measures included IOP reduction and perioperative complications after ASTS in each group.

Results: Mean preoperative IOP was 44.2 mmHg in group 1 and 53.3 mmHg in group 2 (p = 0.05). After IVB injection in group 1, iris neovessels regressed markedly with relative clarity of the media and quietness of anterior chamber. Average duration between IVB injection and ASTS was 12 days. IOP at last follow-up records was 19.5 mmHg in group 1 and 17.6 mmHg in group 2 (p = 0.5), with 5 eyes in group 1 and 2 eyes in group 2 on antiglaucoma drops. Postoperative complications after ASTS were comparable between both groups (4 events in group 1 and 3 in group 2). One eye in each group had one surgical intervention to treat postoperative complications. One eye in the PRP-AST group required additional glaucoma surgery.

Conclusion: Intravitreal Bevacizumab is a useful preparatory step to safely and effectively implant an aqueous shunting tube in eyes with severe NVG that cannot be treated preoperatively by panretinal photocoagulation.

P45
SHORT-TERM OUTCOME OF A NEW GLAUCOMA DEVICE
University of Pisa, Italy

Purpose: To evaluate efficacy and safety of a new device for refractory glaucoma, connecting the anterior chamber directly with the supra-choroidal space by microchannels.

Methods: 28 patients (19 males, 9 females) underwent Solx® gold shunt implant in the supra-choroidal space. All patients were examined after 1, 7, 30, 90 days after surgery, with a complete ophthalmic examination. Ultrasound biomicroscopy (UBM) was performed at 30 and 90 days visits.

Results: Mean preoperative IOP was 28.6 ± 3.4 mmHg and 2.2 number of medications; mean post-operative IOP values were respectively: 13.9 ± 3.2 mmHg at one day after surgery; 15.5 ± 2.1 mmHg at seven day after surgery; 16.5 ± 2.1 mmHg at thirty day after surgery; 15.8 ± 2 mmHg at ninety day after surgery; 15.2 ± 1.7 mmHg at thirty day after surgery; 15.8 ± 2 mmHg at ninety day after surgery and 1.2 number of medications. UBM showed in 80 % of patients increase of supra-choroidal space behind the implant, in 12% of patients a subconjunctival filtration; in all patients we observed IOP spikes variable during follow-up. Major complications observed are in 42% of patients transitory hyphema, in 15% of patients a reversible choroidal detachment.

Conclusions: This new glaucoma device showed a very good efficacy and safety even if in refractory glaucoma is very important not to stop the medical preoperative therapy to avoid or reduce the IOP spikes. We suppose that in first postoperative time the aqueous outflows between the subconjunctival traditional way as a trabeculectomy and only in a second time the supra-choroidal space will be open and the spikes disappear.
Aims: In Molteno device, a restriction system to temporarily close the tube is advisable to prevent hipotony. A nylon suture passing through the lumen and/or ligation of the tube with a self-absorbable suture are usually used. Postoperatively, the nylon suture may be easily removed if the IOP is too high, but the sudden decrease of IOP may be dangerous.

Material and methods: We have reviewed 42 eyes with Molteno device in which a nylon suture was placed inside the tube.

Results: In 28 eyes, the suture was removed after a median time of 6 weeks, mean time 19. 82 (range; 1 - 130). Mean previous IOP was 30.29 + 14.05 mmHg, which was reduced to 13.18 + 10.44 mmHg immediately after the removal and to 21.68 + 12.23 mmHg one week later. Complications appeared in two cases, one persisting hipotony with flat anterior chamber in which a ligation of the tube was necessary to control the IOP and one massive hemorrhagic choroidal detachment 12 hours after the removal.

Conclusions: Although removing the suture is very easy, some measures may be advisable to prevent complications. We recommend waiting until the 4-6th week, trying not to produce a sudden marked decrease of IOP, and if this can’t be avoided, filling the anterior chamber with viscoelastic and reviewing the patient shortly after the removal to check the IOP.

Purpose: To evaluate the change in corneal endothelial cells after Ahmed glaucoma valve implantation

Methods: We prospectively evaluated changes in density and shape of the corneal endothelium in 40 eyes (36 patients) those had undergone AGV implantation for the treatment of refractory glaucoma. The corneal specular microscopy was performed by non-contact specular microscope before surgery and 1, 6, 12, 18, 24 months after surgery. Evaluation was performed on the superior, superotemporal, supranasal and central area of the cornea in both eyes at each test. The changes at each time point were compared to the baseline and the control group, which consisted of 20 contralateral eyes of 20 subjects those had glaucoma and shown moderately controlled intraocular pressure with one or more of anti-glaucoma medications.

Results: The mean follow-up was 19.3 months (range, 9~24 months). There was a significant decrease in the average corneal endothelial cell count of the operated eye from baseline; 5.9% at 1 month, 11.0% at 6 months, 15.0% at 12 months, 16.3% at 18 months, and 18.3% at 24 months after surgery (p < 0.05, Wilcoxon signed ranks test), while the central cornea showed the lowest decrease (12.0 at 1 year and 15.3% at 2 years). The morphological evaluation, by coefficient of variation in cell area and hexagonality, showed no statistically significant change during study period.

Conclusions: There was a statistically significant corneal endothelial cell loss in the operated eyes after AGV implant surgery, compared to the control eye, and the cell loss was increased over time, up to 18.3% on average at 2 years after surgery.

Purpose: To determine the efficacy and the safety of preserved corneoscleral patch graft to cover glaucoma implant tubes.

Methods: This is a prospective study from 23 eyes of 23 consecutive patients with refractory glaucoma who underwent glaucoma drainage device implantation (12 Ahmed, 11 Molteno) at the Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand from March to December 2005. The conventional surgical technique was performed except the preserved corneoscleral graft was used to cover the scleral entry site and the tube on the sclera. The clear portion of the corneoscleral graft was positioned over the ligature in order to provide a good visualization of the ligating suture if the laser suture lysis may be needed. The demographic data, intraocular pressure (IOP), best corrected visual acuity (BCVA), complications and numbers of anti-glaucoma medication were recorded at preoperative, postoperative day 1, week, 1 month and then every 3 months follow up periods.

Results: There were 12 males and 11 females with the mean age of 45 year-olds included in this study. Mean IOP+/-SD significantly decreased from preoperative IOP of 30.2 ± 13.3 mmHg to postoperative IOP at last visit of 17.2 ± -9.6 mmHg (p < 0.001). Mean anti-glaucoma medication significantly reduced from 4.0 ± 0.8 to 1.3 ± 1.5 postoperatively. After mean follow-up of 20 months, graft-related complications included 3 eyes with tube exposure from conjunctival retraction (2 eyes with Ahmed and 1 eye with Molteno). The corneoscleral patch and autologous conjunctival grafting was then performed. There were 2 eyes experienced dellen.

Conclusion: The preserved corneoscleral patch graft is safe and effective for glaucoma tube implantation. It provides a clear portion to facilitate the possible postoperative laser suture lysis of the ligating seton tube. Most corneoscleral graft survived during the mean follow-up of 20 months. The graft related complications include tube exposure and dellen.
ually close to the corneal endothelium and result in corneal edema and decompensation. When corneal-tube contact is seen, removal of the tube from the anterior chamber and new reinserction may be necessary. Tube insertion into the ciliary sulcus or pars plana insertion could also be performed, but a complete posterior vitrectomy is needed. Because these techniques may require revision of the previous surgery and possible complications, we present a case report in which a simpler technique, previously described by Freedman, was performed.

Case report: a 62-year old man with secondary neovascular glaucoma. A double plate Molteno implant was placed. During postoperative period tube-endothelium contact was observed. A double armed 10-0 prolene suture was used to splt the tube within the anterior chamber. We describe the technique: the straight needle of the prolene suture is introduced into the anterior chamber at the limbus under the conjunctiva, is passed over the tube and exits at the opposite limbus. Then opposite way of the needle crosses the tube a few millimeters above or below from the previously placed suture. The two ends of sutures are tied at the limbus, increasing the tension of sutures, and the knot is buried by conjunctiva.

Discussion: Pars plana insertion, ciliary sulcus insertion or anterior chamber replacement when tube-endothelium contact is needed. Prolene splinting suture is an easy method to keep the tube away from the cornea. This surgical technique can be performed with topical anesthesia, and secondary complications are avoided. It is an alternative technique in patients who reject new surgeries, when conjunctiva is extremely damaged, when penetrating queratoplasty has been performed in order to preserve the corneal graft and as a temporary solution.

P50
BAERVELDT’S IMPLANTATION FOR THE TREATMENT OF REFRACTORY GLAUCOMA IN KERATOPROSTHESIS PATIENTS
Y. Leelachaikul, W. Supakontanasan
Department of Ophthalmology, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Purpose: To describe the effectiveness of glaucoma drainage implantation for the treatment of refractory glaucoma in Boston Keratoprosthesis type I patients.

Methods: The study is a non-comparative, interventional case series. Five eyes in 5 patients who developed secondary glaucoma as a complication of Boston keratoprosthesis type I implantation were included. All patients had progressive optic disc cupping and intraocular pressure were uncontrolled with maximum anti-glaucoma medications. The patients underwent Baerveldt’s implantation with tube insertion into the vitreous cavity 4 mm. from the limbus. The intraocular pressure (IOP) was determined by digital palpation and compared with the fellow eye.

Results: The follow-up period ranged from 3 to 6 months. No complication was noted on the first few postoperative days. Immediate decrease in the IOP was observed and the filtering bleb was presented after the chromic catgut removal. These effects were continued through out the follow-up period. Four eyes showed no change in the visual acuity but one eye showed decreased visual acuity and also choroidal detachment 1 week after the chromic catgut removal.

Conclusion: The present study shows that Baerveldt’s implantation provides effective IOP control in eyes with secondary glaucoma from keratoprosthesis.
Methods: This prospective study involved 65 eyes of 59 patients with therapy-resistant glaucoma. The major types of glaucoma were primary open-angle glaucoma (POAG) - 48 eyes, lens-induced secondary glaucoma - 12 eyes, diabetes-associated neovascular glaucoma - 5 eyes. The series comprised 42 males and 17 females, aged from 30 to 87 years. Prior to surgery the IOP ranged from 28 to 49 mmHg. All patients were divided into 2 groups by the type of operation: 50 eyes underwent sinus-trabeculectomy (group A) and in 15 eyes was made non-penetrating deep limbusclerectomy (group B). In the group B were included patients only with POAG, the rest of the patients was in the group A. "Hemashield" implant was applied in 55 patients (group A - 42, group B - 13) and "Allobraft" was applied in 10 patients (group A - 8, group B - 2). Implant position towards limbus was parallel in 36 cases (group A - 30, group B - 6) and perpendicular in 29 cases (group A - 20, group B - 9).

Results: The follow-up period varied from 5 months to 4 years. Surgery failed during the first month in 3 cases of diabetes-associated neovascular glaucoma and in 1 case of terminal stage of POAG. In 1 year at 4 patients after non-penetrating deep limbusclerectomy was made Nd:YAG laser goniopuncture due to raised IOP. At the rest of the patients the IOP was lower than 21 mmHg without medications during all the follow up period. Implant rejection was not observed in either patient.

Conclusions: 1. Implants made from "Hemashield" and "Allobraft" has been shown to be effective in long term follow-up (up to 4 years) of therapy-resistant glaucoma. 2. They are effective in both penetrating and non-penetrating glaucoma surgeries. 3. Effect of the operation doesn’t depend on the implant position towards limbus.

P53
LONG-TERM OUTCOMES OF COMBINED PARS PLANA VITRECTOMY AND PARS PLANA GLAUCOMA DRAINAGE IMPLANTS IN COMPLICATED GLAUCOMAS
B. Prum, C. Mertz, J. Tiedeman
Department of Ophthalmology, University of Virginia, Charlottesville, Virginia, USA

Purpose: To investigate the long-term intraocular pressure (IOP) control and rates of complications in a large series of eyes undergoing combined pars plana vitrectomy (PPVtx) and pars plana Baerveldt glaucoma implant (PPGDI).

Methods: Sixty-five eyes were identified with complicated glaucomas without penetrating keratoplasty that underwent PPVtx and PPGDI at a single center by two surgeons between 1996 and 2007. Fifty-five eyes (52 patients) with a minimum of 6 months follow-up were analyzed retrospectively. Pre-operative demographic data including age, gender, ethnicity, eye, primary and secondary glaucoma diagnoses, other ocular diagnoses, lens status, prior ophthalmic surgeries, and glaucoma medications were recorded. IOP measurements, number of required glaucoma medications, complications, and visual acuity (VA) were recorded at each post-operative visit. Data analysis was performed on resulting IOP, change in IOP, VA, complications, and medication requirement changes with emphasis on Kaplan-Meier survival analysis.

Results: Mean follow-up was 40 months (range 6-120). Successful IOP control (> 5 and < 22 mmHg ≥ medications) at 12, 24, 36, 48, and 60 months was achieved in 85, 81, 78, 78, and 78% of eyes, respectively. Mean IOP reduction was 68%, from a pre-operative mean of 32 mmHg (range 5-75) to a post-operative mean of 12 mmHg (range 1-36). Glaucoma medication requirement was reduced from a pre-operative mean of 3 medications (range 0-6) to a post-operative mean of 1 medication (range 0-4). There was no significant difference in outcome based on pre-operative demographic data or diagnostic group. VA was improved in 24 eyes (43.6%), unchanged in 17 eyes (30.9%), and worsened in 15 eyes (27.3%). Forty eyes (72.7%) experienced complications. The most common complication was re-operation for any reason (17 eyes; 30.9%), followed by chronic iritis (16 eyes; 29.1%), corneal edema (13 eyes; 23.6%), intraoperative corneal epithelial defect (10 eyes; 18.2%), and retinal detachment (8 eyes; 14.5%).

Conclusions: This study represents the largest reported series of eyes with complicated glaucomas undergoing PPVtx and PPGDI. Our study shows that this procedure provides excellent long-term IOP control compared to published studies with anterior chamber GDI placement. However, this procedure carries a high rate of morbidity that must be considered.

P54
AHMED GLAUCOMA VALVE IMPLANTATION IN PATIENTS WITH REFRACTORY GLAUCOMA
A. Satici, M. Guzey, S.K. Karaman, F. Ordulu
Department of Ophthalmology, School of Medicine, University of Harran, Sanlıurfa, Turkey

Objective: To assess the results of Ahmed glaucoma valve (AGV) implantation in patients with refractory glaucoma.

Methods: A retrospective chart review of 20 eyes of 20 patients who underwent AGV implantation with a minimum follow-up period of 3 months was performed. Success was defined according to 2 criteria: (1) intraocular pressure (IOP) of 6 mmHg or more or 21 mmHg or less, and (2) IOP reduction of at least 30% relative to preoperative values. Intraocular pressure (IOP) reduction, preoperative and postoperative visual acuities, the number of hypotensive medications required, and complications associated with the operation were evaluated. Data were collected on day 1; weeks, 1; months, 3; months, 6; months, and last visit.

Results: One year after surgery, intraocular pressure (IOP) was controlled (21 mmHg or less) in 18 of 20 eyes (90%), eight (60%) did not need medical antiglaucoma therapy. The IOP was controlled (21 mmHg or less) in 18 of 20 eyes (90%), eight (60%) did not need medical antiglaucoma therapy. The average IOP decreased from 39.3 ± 7.2 mmHg to 21.1 ± 9.5 mmHg at last follow-up. The average number of topically used medications decreased from 2.7 ± 1.1 to 0.6 ± 0.82 (p < 0.001). Complications included transient hypotony (one eyes), shallow anterior chamber (one eyes), hyphema (two eyes), corneal decompensation (one eyes), transient choroidal effusion (one eyes), hypertensive phase (two eyes) and an intermediate increase in IOP (five eyes). Needling/bleb excisione was performed in one eye. Mean follow-up was 8.7 months (3-12 months).

Conclusion: The AGV was found to be effective method for treating refractory glaucoma.

P55
EX-PRESS GLAUCOMA IMPLANT PLACEMENT UNDER THE CONJUNCTIVA OR SCLERAL FLAP VERSUS TRABECULECTOMY
I. Yalvac1, U. Eksioglu2, B. Satana3, B. Oncel1, S. Duman4
1 Yeditepe University Eye Hospital, Istanbul, Turkey, 2 Glaucoma Department, Ankara Research and Education Hospital, Ankara, Turkey

Purpose: To compare placement of the Ex-PRESS glaucoma implant under the conjunctiva or scleral flap to trabeculectomy.

Methods: The implant was inserted under the conjunctiva in 13 patients (group 1) and under the scleral flap in 12 patients (group 2), and 20 patients underwent trabeculectomy (group 3). Intraocular pressure (IOP), surgical success, glaucoma medications used, visual acuity, and complications were evaluated in all groups postoperatively.

Results: Mean follow-up was 9.93 ± 2.26 months (range: 8-
The pericardium (Tutoplast®) plug seems to be an effective method in the repair of corneoscleral fistulas after Ahmed Glaucoma Valve (AGV) explantation. Methods: In 4 cases where exposure of the AGV tube had occurred, the AGV explantation was performed using a pericardium (Tutoplast®) plug to seal the defect previously occupied by the tube. After debridement of the fistula, a piece of processed pericardium (Tutoplast®), measured 1 mm in width, was plugged into the fistula and secured with two interrupted 10-0 nylon sutures. For intraocular pressure control, a new AGV was implanted elsewhere in case 1, phaco-trabeculectomy was performed concurrently in case 2, cyclophotoagulation was performed postoperatively in case 3 and anti-glaucomatous medication was added in case 4. Results: No complication related to the fistula developed at each follow-up evaluation (p > 0.005). In group 1, 8 patients (61.5%) had a shallow anterior chamber and 6 (46%) had choroidal detachment, whereas only 1 patient had choroidal detachment in group 2 and group 3 (p < 0.001). Conclusions: There was a significant increase in lens thickness following peripheral YAG iridotomy performed for angle closure disease in the medium term.

Purpose: To compare changes in anterior chamber depth and lens thickness following peripheral YAG iridotomy performed for angle closure disease and among normal controls at a minimum of three years after YAG iridotomy.

Methods: 125 persons with angle closure disease and 25 randomly selected normal controls from the urban arm of the Chennai Glaucoma Study underwent anterior chamber depth and lens thickness assessment using A Scan ultrasound at baseline. Those with angle closure disease (primary angle closure suspects, primary angle closure and primary angle closure glaucoma) underwent YAG peripheral iridotomy. Serial biometric measurements were repeated over a 3 to 5 year follow up. The paired t test was used to compare AC depth and lens thickness measurements. Only the right eye was used for analysis. Results: The mean (SD) baseline AC depth measurements were significantly different 2.43 (0.30) mm and 2.50 (p = 0.002) at the final visit. The mean lens thickness was significantly greater 4.75 (0.35) at the final visit (p = 0.0001) than at the baseline 4.35 (0.35). The AC depth (p = 0.07) and lens thickness values (p = 0.44) for the control group did not vary over time.

Conclusions: There was a significant increase in lens thickness measurements in eyes undergoing YAG iridotomy for angle closure disease in the medium term.
Results: After data depuration, 5000 patients were included grading as excellent, good, sufficient or insufficient. Formed an ophthalmologic examination in order to value the collected retrospectively. After that the ophthalmologist performing an ophthalmologic examination in order to value the degree of control of the disease with the current medication grading as excellent, good, sufficient or insufficient.

Results: After data depuration, 5000 patients were included grading as excellent, good, sufficient or insufficient.

Results: After data depuration, 5000 patients were included grading as excellent, good, sufficient or insufficient.

Results: After data depuration, 5000 patients were included grading as excellent, good, sufficient or insufficient.

Conclusions: These data demonstrate that 36.3% of patients treated with prostaglandins (latanoprost, bimatoprost, and travoprost) had better control of the disease compared to beta-blockers [excellent: 77.9% vs. 19.1%; good: 65.8% vs. 28.2%; sufficient 52.8% vs. 35%; insufficient: 26.4% vs. 57.9% respectively]. Half the population (51%) needed a change of treatment, being the lack of efficacy the principal reason (69.5% of the cases). Therapy changes were more frequent among the patients treated with beta-blockers (54.1%) than with prostaglandins (30%), and with other treatments (15.9%).

A. Sherwood4, M. Schwartz4, J. Walt5
5 Allergan, Inc., USA

Conclusions: These data demonstrate that 36.3% of patients with glaucoma and/or ocular hypertension do not have a suitable control of the disease with their monotherapy treatment. This is more remarkable in the case of beta-blockers group (57.9%) compared to other treatment groups. Our findings confirm the need for a narrow follow-up of the evolution of the disease and its treatment.

P60
EVALUATION OF THE PERSISTENCE DEGREE OF PATIENTS IN FIRST-LINE MONOTHERAPY: ANTIGLAUCOMATOUS TREATMENT IN SPAIN
B. Marti1, A. Arias2, K. Schargel3, F. Ussa4, M.I. Canut5, A. Robles6
1 Universidad Autónoma de Madrid, 2 Ophthalmology Department, Fundación Hospital Alcorcón, Alcorcón, Madrid, 3 Ophthalmology Department, Hospital de Torrevieja, Alicante, 4 Instituto Universitario de Oftalmología Aplicada (IOBA), Valladolid, 5 Centre de Oftalmología Barraquer, Barcelona Spain

Purpose: To find out the persistence degree (period of time of continuous therapy with the drug prescribed) of glaucoma patients treated with prostaglandin (latanoprost, bimatoprost, and travoprost), or b-blocker (timolol) monotherapy.

Methods: An observational and prospective study was conducted of a 24-month follow-up in 191 patients (from 4 centers), to examine the time elapsed until patients’ withdrawal from therapy. The required parameters were obtained from patients’ medical records. A descriptive analysis, a Kaplan-Meier survival analysis, and a Cox regression model were used to determine which was the drug related to a greater persistence degree, and to detect variables significantly influencing persistence in these patients.

Results: In both the descriptive analysis and the survival curves, latanoprost was associated with a higher persistence degree in the glaucoma treatment: 81.6% vs. 22.9% for bimatoprost, 65.4% for travoprost and 60.5% for timolol (p < 0.0001). The persistence degree was significantly influenced by the following variables: the antiglaucoma agent used as monotherapy, with a six-fold higher risk of treatment withdrawal during the follow-up period due to receiving travoprost instead of latanoprost (p < 0.0001); and the age (p = 0.001). Even though comorbidities did not indicated to be directly related to persistence, their occurrence was related to age. The main reasons for treatment withdrawal were lack of efficacy and the existence of intolerance and/or adverse events, significantly superior in the bimatoprost group, 28.6% (p < 0.001) and 48.6% (p < 0.001), respectively.

Conclusions: Latanoprost shows a higher persistence degree compared to travoprost, bimatoprost and timolol in routine clinical practice, resulting in a better control of IOP and lower associated costs, improving the health care quality of glaucomatous patients and considerable resources saving for the National Health System.

P61
EPIDEMIOLOGICAL STUDY OF GLAUCOMA PREVALENCE AND SPECTRUM OF GLAUCOMA SEVERITY IN THE THESSALONIKI EYE STUDY (TES)
1 Duke University Eye Center, 2 University of Southern California, 3 Analytica International, 4 MedNet Solutions, Inc., 5 Allergan, Inc., USA

Objectives: To determine the distribution of glaucoma severity in a community care setting in the US and to determine the agreement between patients’ glaucoma stage from data collected by ophthalmologists using Humphrey Mean Deviation (HMD) and glaucoma stage determined by a validated modified Bascom-Palmer staging system based on visual field loss, visual acuity, and other ophthalmologic factors such as intraocular pressure.

Methods: Patients were sampled from 43 ophthalmology practices, chosen based on participation in two ophthalmology registries. Patient data on factors such as demographics, risk factors, visual field test results, and IOP lowering medication use during the ophthalmologist visit were collected via case report forms. Sites enrolled 50 consecutive patients with glaucoma or ocular hypertension. Ophthalmologists staged patients using a modified Bascom Palmer scale. Patients were also staged by a computer algorithm of the modified Bascom Palmer scale. Of the 2296 patients sampled, visual field testing was performed between February and June 2007 on 2092 OD and 2097 OS. If visual field testing could not be performed the eye was considered stage 5. Kappa statistics measured agreement between physician and computer staging.

Results: Mean age of the sample was 68.7 years (SD = 14.3); the majority were women (58.4%). Physicians staged patients less severely than the modified Bascom Palmer scale, and agreement between HMD stage and glaucoma scale was fair; OD Kappa: 0.5163 (95% CI: 0.4724 - 0.5603), OS Kappa: 0.4820 (95% CI: 0.4384 - 0.5256).

Conclusion: Patients were most likely to have early-stage glaucoma (stages 0-2). Physician staging of glaucoma patients based on factors ascertained during an office visit results in similar staging to the computer algorithm, but physician staging may tend to underestimate stage.
Purpose: To report the patterns of glaucoma treatment in open-angle glaucoma (OAG) patients and OAG suspects in a population-based sample of subjects 60 years of age or older in Thessaloniki, Greece.

Methods: A total of 2554 subjects randomly identified from municipality registers in Thessaloniki were interviewed with a questionnaire and underwent a complete ophthalmologic examination. Participants were classified as OAG (either primary open-angle glaucoma (POAG) or pseudoexfoliative glaucoma (PEXG)) and OAG suspects according to specific criteria. Distribution of glaucoma medications use and the proportion using monotherapy among OAG patients and OAG suspects were assessed. Comparisons among OAG patients and OAG suspects were based on Fisher exact tests.

Results: There were 141 OAG (98 POAG/43 PEXG) subjects identified in TES. Of those with OAG, 50.4% were previously undiagnosed. Of OAG subjects, 40.4% were receiving glaucoma medications and 11% of OAG had prior glaucoma surgery including laser. Among the 2261 clinic-visit participants, there were 52 OAG patients and 45 OAG suspects receiving glaucoma medications. 78% of OAG suspects used b-blockers compared to 58% of OAG subjects (p = 0.05), while 33% of OAG suspects used prostaglandin analogues compared to 65% of OAG subjects (p = 0.02). OAG subjects were also more likely to use carbonic anhydrase inhibitors (11% vs. 42%, p < 0.001) and alpha 2-agonists (2.2% vs. 17%, p = 0.018) than OAG suspects. 25/52 (48%) OAG subjects and 33/45 (73%) OAG suspects were on glaucoma monotherapy (p = 0.014). Among those receiving monotherapy, indicating first choice glaucoma treatment preference, 76% of OAG suspects used b-blockers compared to 28% of OAG subjects (p < 0.001), while 21% of OAG suspects used prostaglandin analogues compared to 56% of OAG subjects (p = 0.012).

Conclusion: Previously-diagnosed OAG subjects in TES were more likely to be using prostaglandin analogues, carbonic anhydrase inhibitors, and alpha-2 agonists while OAG suspects were more likely to be using beta-blockers. Ophthalmologists were more likely to prescribe as first choice therapy prostaglandin analogues in OAG subjects and b-blockers in OAG suspects.

This abstract was submitted to the 2008 ARVO meeting.

P63

RISK FACTORS FOR OPEN-ANGLE GLAUCOMA IN THE THESSALONIKI EYE STUDY (TES)

A.L. Coleman1, M.R. Wilson2, A. Harris3, E. Anastasopoulos4, F. Yu1, A. Koskosas4, T. Pappas4, P. Founti1, F. Topouzis4
1 Center for Eye Epidemiology, Jules Stein Eye Institute, David Geffen School of Medicine, University, Los Angeles, CA, USA, 2 School of Medicine, University of Colorado Denver and Health Sciences Center, Denver, CO, USA, 3 Department of Ophthalmology, Indiana University, Indianapolis, IN, USA, 4 Department of Ophthalmology, Aristotle University of Thessaloniki, Thessaloniki, Greece

Purpose: To report risk factors associated with open-angle glaucoma (OAG) in TES.

Methods: TES is a cross-sectional population-based study of glaucoma and other eye diseases in the Greek population of Thessaloniki. A total of 2554 subjects, randomly identified, were interviewed with a questionnaire and underwent a complete ophthalmologic examination. Participants were classified as open-angle glaucoma (OAG) according to specific criteria. Subjects with OAG were compared to controls with regards to demographic (age, sex), behavioral (smoking, alcohol, diet, sleep, BMI), systemic (hypertension, diabetes, diabetic treatment, history of cardiovascular diseases, migraines), and ophthalmic (IOP, pseudoexfoliation, and myopia) factors. Multivariate analysis, using multiple logistic regression models, were performed and included factors with p < 0.2 in univariate analyses.

Results: In TES, 135 OAG and 1668 controls were identified and included in the analysis. After adjustment for potential covariates, increased age (OR:1.07; 95% CI:1.04-1.10 per year) and increased IOP (OR:1.22; 95% CI:1.17-1.27 per mmHg) were associated with higher odds for OAG, while history of coronary artery bypass or vascular surgery showed borderline significance (OR:1.69; 95% CI:0.96-2.97). In the analysis restricted to those who were bilaterally phakic (104 OAG/ 1460 controls), pseudoexfoliation (OR:2.26; 95% CI:1.50-4.57) and mild (1-3 D) or moderate (≥ 3 D) myopia (OR:2.08; 95% CI:1.01-4.29 and OR:2.65;95% CI:1.23-5.75, respectively), and history of coronary artery bypass or vascular surgery (OR:2.27; 95% CI:1.17-4.40) were associated with OAG, in addition to age and IOP.

Conclusions: Subjects who were older and had higher IOPs were more likely to have OAG in TES. In subjects who were bilaterally phakic, pseudoexfoliation, myopia, and a history of vascular surgery were also risk factors for OAG. This abstract was submitted to the 2008 ARVO meeting.

P64

EPIDEMIOLOGY OF GLAUCOMA IN UKRAINE

S. Rykov1, O. Vitovska2, G. Stepanyuk1
1 Kiev, Eye Microsurgery Centre, 2 Ukrainian National Medical University, Ukraine

Glaucoma (H40-H42 in International Classification of Diseases) is progressive chronic disease. It affects mainly able-bodied population and needs high value treatment. It is the second cause of blindness in the world and this fact makes glaucoma important socio-economic and medical problem.

The aim: To evaluate incidence and prevalence of glaucoma in Ukraine in period from 2001 to 2006 y.

Methods: Analyses were based on population databases for ages ≥ 15 years in period from 2001 to 2006 y.

Results: Over a period observation the incidence of glaucoma in Ukraine increased from 47 (in 2001) to 65.2 (in 2006) (+29.8%), its prevalence increased from 370 (in 2001) to 517.8 (in 2006) per 100000 of population. It increased on 30.7%. The population being under observation increased from 323.4 (in 2001) to 463, 6 (in 2006) per 100 000 (+33.96%). Disability index also increased and in 2006 was 2.7 per 100000 and took second place in the disability structure in Ukraine.

Conclusions: The increasing of incidence and prevalence of glaucoma in Ukraine reflects worldwide tendency and requires deep analyses of real causes, development the methods of prophylaxis, increasing of medical care quality.
**Poster Session 8**

**HEALTH ECONOMICS**

**P65**

**MEDICAL COST DRIVERS OF GLAUCOMA IN SWEDEN**

P. Buchholz, B. Bengtsson, O. Ström, J. Walt, J. Mesterton, A. Heijl

1: Allergan Europe, Ettlingen, Germany, 2: Department of Ophthalmology, Malmo University Hospital, Malmo, Sweden, 3: Innovus, Stockholm, Sweden, 4: Allergan, Inc., Irvine, CA, USA

Purpose: To estimate the direct medical costs of glaucoma in Sweden and to investigate hypothesized cost drivers: intraocular pressure (IOP), amount of visual field damage estimated by the mean defect (MD), change of MD (ΔMD) and pseudoxfoliation syndrome (PEX).

Methods: Swedish patients (N = 583) with open-angle glaucoma and manifest field loss were followed for between 4.5 and 9.25 years. Data on MD, IOP, PEX, medical resources, and low-vision centre visits were collected and organized in 3-month periods. All resources used were multiplied by their respective unit costs to calculate the medical costs for each patient. Cost regressions were estimated with a multivariate population-averaged panel data model.

Results: The average baseline MD was -11.7 dB, and initial values of average IOP and age were 22.5 mmHg and 71 years, respectively. The average annual medical cost per patient with glaucoma was estimated at € 627 per year. Independent cost drivers were IOP (p < 0.001), MD (p < 0.001), ΔMD (p = 0.03), and PEX (p < 0.001). Prevalence of PEX was associated with 21% higher costs. Each 1-unit increase in mmHg (IOP), decrease in dB (MD) or ΔdB/year (ΔMD) increased costs by 2.9%, 1.2%, and 5.7%, respectively. Patients that had visited a low-vision centre at least once (ΔMD) increased costs by 2.9%, 1.2%, and 5.7%, respectively. Patients who had visited a low-vision centre at least once had 46% higher annual costs than those who had not.

Conclusions: MD, ΔMD, IOP and PEX are all drivers of medical cost of glaucoma in Sweden. Further, the variables predict cost independently of each other.

**P66**

**QUALITY OF LIFE MEASUREMENTS IN PATIENTS WITH GLAUCOMA**

C. Hirneiss

University Eye Hospital, Munich, Germany

Purpose: Patients’ quality of life in different health-states and patient-perceived value of an intervention are of increasing interest. There are different methods to measure the health-related quality of life, including the field of glaucoma.

Methods: The most relevant methods to evaluate the patients’ quality of life with the diagnosis of glaucoma are displayed to estimate the individual impairment by the disease.

Results: Quality of life measurements in glaucoma can be performed either by using instruments that quantify preferences in the term of utilities or by disease-specific questionnaires.

Well-known tools to measure utilities are time-trade-off and standard gamble and have already been used in glaucoma patients. In most studies, significant impair of utility is observed in advanced glaucoma, in concordance with the nature of the disease. Utility assessment allows profound economic evaluation. There are also some glaucoma specific questionnaires that have been developed and are used in practice.

Conclusion: There are different methods to estimate the quality of life in patients with glaucoma. Values obtained by these estimations can help in medical decision making and allow economic evaluations.

**P67**

**COST-EFFECTIVENESS ANALYSIS OF THE FIXED COMBINATIONS BRIMONIDINE/TIMOLOL AND DORZOLAMIDE/TIMOLOL IN 10 EUROPEAN COUNTRIES**

A. Hommer, J. Wickstrom, J. Walt, P. Buchholz

1: Private Practice, Vienna, Austria, 2: MUUSMANN Research & Consulting A/S, Kolding, Denmark, 3: Allergan, Inc., Irvine, CA, USA, 4: Allergan Europe, Ettlingen, Germany

Purpose: Several studies have shown that reduction in intraocular pressure (IOP) to a target level ≤ 18 mmHg prevents further visual field deterioration. The objective of this analysis was to compare the efficacy and the cost-effectiveness of the fixed combinations brimonidine/timolol (Combigan®) and dorzolamide/timolol (Cosopt®) in 10 European countries.

Methods: Efficacy and safety of the two fixed combination products were based on pooled data from 2 head-to-head trials. Efficacy was measured as the percentage of patients reaching a predefined target IOP ≤ 18 mmHg or ≤ 13 mmHg after 3 months of treatment. Discontinuation rates due to adverse events were also included in the model, and it was assumed that patients discontinuing treatment had an extra ophthalmologist visit. All drug costs were market prices inclusive of VAT, and ophthalmologist visit costs were priced using official tariffs.

Results: Clinical efficacy data showed that Combigan® was more effective than Cosopt® in terms of lowering patients’ IOP to a target level. The percentage of patients reaching IOP ≤ 13 mmHg was 32.65% for Combigan® and 13.95% for Cosopt® (p =.0359). 77.55% of Combigan® patients reached a target IOP ≤ 18 mmHg, and 60.47% of Cosopt® patients did (p =.0756). Three months’ health care costs for patients treated with Combigan® were comparable to those of Cosopt® in the 10 studied countries.

Conclusions: The cost-effectiveness analysis revealed that Combigan® was less costly and more effective in Italy, Spain, and Norway, whereas Combigan® was more effective and slightly more costly in Germany, the United Kingdom, Denmark, Sweden, the Netherlands, Portugal and France. In these countries, the incremental cost per patient reaching a target IOP ≤ 18 mmHg ranged from £ 0.32 (United Kingdom) to £ 26.66 (the Netherlands). For IOP ≤ 13 mmHg the range was £ 0.29 (United Kingdom) to 24.36 (the Netherlands).

Hence, Combigan® is effective in terms of lowering IOP and, furthermore, a cost-effective treatment strategy for patients with glaucoma.
P68

OCT GUIDED REFERENCE PLANE FOR SCANNING LASER TOMOGRAPHY MEASUREMENTS OF THE OPTIC DISC IN NORMALS AND GLAUCOMAS

D. Baleanu, R. Tornow, R. Laemmer, F.E. Kruse, F.K. Horn, C.Y. Mardin
Department of Ophthalmology, University of Erlangen-Nuremberg, Erlangen, Germany

Purpose: Retinal surface derived reference plane of scanning laser tomography (SLT) has been a point of debate for a long time, as retinal thickness is changed in the course of glaucoma disease. Purpose of this pilot study was to evaluate the feasibility of a new reference plane for SLT (HRT I, Heidelberg Engineering, Heidelberg) guided by spectral domain OCT (SD-OCT; Spectralis HRA and OCT, Heidelberg Engineering, Heidelberg) for cross sectional optic disc evaluation and follow-up examinations.

Methods: 11 healthy controls and 11 perimetric glaucoma patients (IOP > 21mmHg, glaucomatous disc damage and visual field defects) were scanned using a commercially available SD-OCT and a SLT. With SD-OCT 20 consecutive B-scans were automatically averaged to reduce speckle noise. An online tracking system compensated for eye movements during data acquisition. A horizontal OCT scan through the centre of the optic disc was used to visualize the temporal retina, Elschnig scleral spur and Bruch’s membrane at 0° temporally. The perpendicular distance between the retinal surface and the scleral spur was measured and this value served to modify the new reference plane. Standard SLT of the optic disc was used at a 10° diameter after averaging of three pictures. After outlining of the contour line standard reference plane and a new reference plane with the OCT measurement was applied to calculate RIM-area and RIM-volume above and cup-area and cup-volume below reference respectively. One eye of each patient was selected for statistic analysis, which was performed using Wilcoxon test for subgroups and ROC curves.

Results: In both, normal and glaucomatous optic discs, the new reference plane resulted in significantly higher values for area and volume above reference and lower values below. HRT’s ability to separate normals from glaucoma was examined using ROC curves of the above mentioned parameters and was found to be increased in comparison to standard reference for all parameters, especially regarding RIM-volume.

Conclusion: New volume variables might improve discrimination between normals and glaucomas. The new reference plane might be useful for SLT-follow-up measurements. The new SD-OCT-guided reference plane in SLT for the first time uses the scleral spur as a fixed landmark in chronic disease, where retinal thickness is reduced in all sectors.

Supported by Deutsche Forschungsgemeinschaft SFB 539 "Glaukome und Pseudoxefolliationssyndrom".

P69

FILTRATION BLEB IMAGING WITH STRATUS OCT

M. Baykara, H. Ozcetin, G. Ucan, S. Türüdü
Uludag University, Bursa, Turkey

Purpose: To evaluate clinical use of time domain optical coherence tomography (OCT) instrument on filtration bleb imaging.

Materials and methods: This study included seventeen eyes that underwent different types of glaucoma filtration surgery. Postoperatively all of the eyes were analysed by Stratus OCT. The images were taken with a vertical and horizontal scan line. The scanning line was positioned at the apex of the filtration bleb. The scanning lines were 5 and 10 mm lengths and consisting of 512 A-scans. The images were evaluated for height, extent, content and wall thickness of the bleb and the position of the scleral flap.

Results: The dysfunctional filtration blebs were flattened and showed high scleral reflectivity. On the contrary the functional filtration blebs were diffuse and filled with subconjunctival fluid causing low scleral reflectivity. The shape of the blebs was changing from smaller to one or multiple cystic forms. Although young bleb walls were thick, oedematous and consisted of stripping fluid-filled line, old and post-trabeculectomy bleb walls were thicker and uniform. Thin-walled and multipl cystic blebs were observed in trabeculectomy with mitomycin C. The conjunctival epithelium, a component of the bleb wall, was often visible as a faint, thin and slightly reflective line (reddish shiny green). The lamina propria of the conjunctiva, almost behind the epithelium, had low reflectivity (green). But, in recently operated patients, fluid-filled stripings with low reflectivity (violet, black) could be seen in this area. The tenon capsule occurred a hyperreflective (pink) layer. The fluid-filled bleb was demonstrated as a hyporeflective (violet, black) dark area and looked like a simple dome or had multilobulated cystic spaces. The scleral flap was lying at the bottom of the bleb as a hyporeflective (green, blue) layer.

Conclusions: Although Stratus OCT is generally used for evaluating posterior segment of the eye, it could be used for anterior segment. In clinical use, it is an easy, fast, non invasive and non contact device for imaging the filtration bleb after glaucoma surgery. It has a high resolution capacity so it is also a reliable method as an optical biopsy technology for evaluating the filtration bleb especially in early postoperative days.

P70

VISUAL FIELD GLOBAL INDICES AND HEIDELBERG RETINAL TOMOGRAPH II PARAMETERS AFTER GLAUCOMA SURGERY

A. Canovetti, F. Francesca, S. Benedetti, M. Nardi, U. Benelli
Department of Neuroscience, Section of Ophthalmology, University of Pisa, Pisa, Italy

Purpose: To detect and quantify changes in optic nerve morphology after glaucoma surgery, using Heidelberg Retina Tomograph (HRT), and in visual field global indices, using Humphrey perimeter.

Methods: The authors enrolled 14 adult patients with chronic open-angle glaucoma (PAOG) undergoing incisional glaucoma surgery, such as trabeculectomy and deep sclerectomy, for progressive glaucoma damage. Intraocular pressure (IOP), visus, such as trabeculectomy and deep sclerectomy, for progressive glaucoma damage. Intraocular pressure (IOP), visual field and HRT were performed 2 weeks before surgery and then repeated 3 and 6 months after.

Results: Our clinical trial evidenced a IOP reduction superior to 40% after glaucoma surgery. The pre-operative average IOP was 24.36 ± 5 mmHg: 3 months after surgery average IOP was 12.07 ± 3.12 mmHg, while it was reduced to 10.64 ± 2.84 mmHg after 6 months. Changing in optic nerve morphology parameters, using Heidelberg Retinal Tomograph, revealed a significant increase in the overall mean RNFL thickness, in Rim Area and Rim Volume, whereas Cup Area, Cup Volume, Cup/Disc Area Ratio, and Maximum Cup Depth decreased. Visual field functional global indices, such as MD and PSD, improved a little bit less than morphological indices. In 57% of our patients we discovered an improvement of all the considered parameters. Multiple linear regression analysis demonstrated that, among the optic disk sectors, the temporal and the super nasal octant improved in direct proportion to
the magnitude of IOP reduction. The improvement appeared to be significant in the first 3 months of follow-up, probably because of the immediate IOP reduction after surgery. By HRT, we noticed an increase in retinal fibres of 0.9 microns and of 0.4 microns every mmHg of IOP reduction, respectively in the first 3 months and in the second period of follow-up. Moreover, between risk factors, such as age, pre-surgery MD, IOP variation, the last one was the most important in changing of optic disc parameter. Regarding visual field global indices, we registered an average evolution from the 4th to the 3rd - 4th stage, using the Brusini Glaucoma Staging System. Conclusions: Our study demonstrated the beneficial effect of IOP reduction, obtained with glaucoma surgery techniques, as trabeculectomy and deep-sclerectomy, on visual field global indices and optic disc parameter evaluated by Heidelberg Retinal Tomograph.

P71
THICKNESS OF THE RETINAL NERVE FIBRE LAYER ESTIMATED WITH THE SCANNING LASER POLARIMETER (GDX VCC) IN HEALTHY CHILDREN
E. Chen, A. Lundvall, U. Lennman, E. Parmér, Y. Vennström
St. Erik Eye Hospital, Stockholm, Sweden

Purpose: To establish normal reference value of the retinal nerve fibre layer (RNFL) thickness in children. Methods: The thickness of the RNFL was measured with a scanning laser polarimeter (GDX VCC) in children without ocular disease. The children were recruited from families and friends of hospital personnel and from children attending the Swedish visual screening program (at 4.0 and 5.5 years of age). No child had a refractive error beyond -1 D or +4 D and all children had a visual acuity of 20/40 or better. The intraocular pressure was 21 mmHg or less. Seventy-two children (38 boys and 34 girls) were included. Of these 67 were Caucasian, three Asian and two Hispanic. The median age was 8.0 years with a range of 4.5 to 15.5 years. The following software derived parameters were collected: TSNIT Average (TA), Superior Average (SA) and Inferior Average (IA). For statisti-cal analysis, data from one eye of each child was randomly selected, and the mean and the standard deviation (SD) for each parameter were estimated. The difference between the boys and the girls was estimated with a t-test. The reproducibility of the Gdx VCC examination was evaluated consecutively in ten of these children by repeating the examination after a short break and it was expressed as a 95% confidence interval (CI) of the differences between the measurements. Results: The mean ± SD of the TA, the SA and the IA for the boys were 61.3 ± 6.1 µm, 72.5 ± 8.9 µm and 73.3 ± 7.3 µm, and for the girls were 60.8 ± 6.9 µm, 74.7 ± 11.1 µm and 73.6 ± 9.6 µm, respectively. There were no statistically significant differences in the TA, the SA and the IA between the boys and girls. The reproducibility of the examination, expressed as a 95% CI of the differences between the measurements, was -0.4 ± 1.4 µm for the TA, -1.5 ± 3.6 µm for the SA and -1.6 ± 3.9 µm for the IA. Conclusion: The GDX VCC examination was reproducible in children. The present RNFL results should represent useful reference values in the evaluation of paediatric glaucoma.

P72
THE RETINAL NERVE FIBER LAYER AND THE OPTIC NERVE HEAD OF PERIMETERMATICALLY UNAFFECTED EYES OF GLAUCOMA PATIENTS: AN OPTICAL COHERENCE TOMOGRAPHY STUDY
S. Da Pozzo, D. Fanni, S. Trovarelli, G. Di Stefano, G. Ravalico
Eye Clinic, Trieste University, Italy

Purpose: To evaluate whether optical coherence tomography (StratusOCT) may detect early changes in perimetrically unaffected (PU) fellow eyes of glaucomatous patients by assessing retinal nerve fibre layer (RNFL) thickness and optic nerve head (ONH) parameters. Methods: Thirty-seven glaucomatous patients with unilateral field loss and 34 age-matched controls were recruited. In glaucoma patients, PU and perimetrically affected (PA) fellow eyes were analyzed separately. For each group, RNFL thickness parameters and ONH measurements mean values (± SD) were calculated and comparisons between groups conducted with Mann-Whitney U-test. Proportion of clock-hour sectors flagged with probability Results: Global (Average Thickness) and sectoral parameters (Superior and Inferior Maximum, Inferior and Nasal Average), Max-min, as well as 2- and 6-o’clock sectors resulted significantly thinner in PU eyes than in control group, whereas ONH analysis did not provide any significant difference between the two groups. Proportion of eyes with clock-hour position flagged with probability Conclusion: Despite absence of any field loss, localized and diffuse RNFL thinning on OCT examination is already measurable in PU eyes of glaucoma patients. Then, these eyes should be considered at risk of developing functional damage over time.

P73
STRUCTURAL AND FUNCTIONAL ANALYSIS IN GLAUCOMA SUSPECTS
D. Chisiletta, C. Danielescu
Iasi University of Medicine and Pharmacy, Romania

Purpose: To establish correlations between structural and functional parameters in glaucoma suspects. Methods: A prospective, non-interventional, comparative study that included patients considered suspects of glaucoma. All patients were subject to standard automated perimetry (HFA II), scanning laser polarimetry (GDx-VCC) of the retinal nerve fibre layer (RNFL) and optical coherence tomography (Stratus OCT) of the RNFL and optic disc. Results: The study included 97 eyes (50 patients). Diagnostic concordance (achieved if one eye is considered normal – respectively abnormal – by both tests) was 67.01% between perimetry and OCT, respectively 60.67% between perimetry and GDx. The Areas under the Receiver Operating Characteristic curve were between 0.492-0.592 for OCT parameters and 0.518-0.548 for GDx parameters (considering the visual field examination as “gold standard”). The correlation coefficient regarding RNFL measurements in OCT and GDx took values between r = 0.481 and r = 0.352. Conclusions: Structural and functional damage are not consistent with each other in glaucoma suspects, resulting in the fact that both tests should be used in the diagnostic strategy.

P74
CENTRAL CORNEAL THICKNESS AND OPTIC NERVE PARAMETERS IN PRIMARY OPEN-ANGLE GLAUCOMA PATIENTS WITH MYOPIA
V. Nereo, O. Kiseleva, L. Yakoubova, M. Erermina
Moscow Helmholtz Institute of Eye Diseases, Russia

Purpose: to evaluate the interrelations between central corneal thickness (CCT), intracocular pressure (IOP) and structural parameters of the optic disc in primary open angle glaucoma (POAG) patients with myopia. Methods: 30 POAG patients (60 eyes) with myopia of 3 diopters and greater underwent eye examination, aplanotom-
etrical, ultrasound corneal pachymetry and optic disc imaging with HRT II. Exclusion criteria were prior ocular surgery and low quality HRT II images.

Results: Mean patients age was 55.1 ± 13.2 years, median Goldmann IOP – 22.2 mmHg. All patients were divided in two groups: 1st group - spherical refraction -4.6 diopters (median axial length 25.2 mm, range 24.8 to 25.5 mm); 2nd group - spherical refraction -7.5 diopters (median axial length 26.5 mm, range 25.8 to 27.9 mm). The median CCT was 563 µm (range 551 to 584 µm) and 511 µm (range 492 to 534 µm), respectively. In the 2nd group the thin corneas (< 530 µm) composed 80%. There was no correlation between CCT and axial length. The CCT/Goldmann IOP positive relationship was manifested in this group (R=0.31). The 2nd group’s patients had significantly greater optic disc area, cup disc area ratio, cup volume, mean cup depth and less rim disc area ratio in compare to 1st group’s patients. For glaucoma patients with myopia CCT was inversely correlated to optic disc area (R = - 0.37).

Conclusions: In primary open angle glaucoma patients with myopia CCT correlates with the larger optic disc surface area, the larger cup area and cup volume. But there was no relationship between CCT and axial length. CCT may be an independent risk factor for glaucoma development in myopic eyes with thinner corneas.

P75

RELATIONSHIP BETWEEN STANDARD AUTOMATED PERIMETRY AND RETINAL NERVE FIBER LAYER PARAMETERS MEASURED WITH OPTICAL COHERENCE TOMOGRAPHY IN EYES WITH GLAUCOMATOUS VISUAL FIELD LOSS

A. Ferreras1, L.E. Pablo1, P. Fogagnolo2, A.B. Pajarín2, V. Polo1, M.J. López-peña1, F.M. Honrubia1

1 Ophthalmology, Miguel Servet University Hospital, Zaragoza, Spain, 2 Family Medicine, Euroresidencia, Zaragoza, Spain

Purpose: To correlate the retinal nerve fiber layer (RNFL) parameters measured with optical coherence tomography (OCT), and the main outcomes of standard automated perimetry (SAP) in glaucoma patients with visual field loss. Methods: 64 eyes of 64 glaucomatous subjects (defined as having abnormal SAP results) were included in the study. At least two reliable SAP tests were performed using a Humphrey Field analyzer (Zeiss Humphrey Systems, Dublin, Ca), with the SITA Standard 24-2 strategy. Abnormal SAP results were considered as a pattern standard deviation (PSD) significantly elevated beyond the 5% level and/or a Glaucoma Hemifield Test outside normal limits. All of them underwent imaging with the Stratus OCT 3000 (Carl Zeiss Meditec, Dublin, Ca). Pearson’s correlation coefficients (Pearson’s r) were calculated between OCT parameters and mean deviation (MD), PSD, and threshold values converted to a linear scale at each point of the SAP tests. Results: MD was -6.70 ± 6.29, and PSD was 5.17 ± 3.76. Significant correlations were found between most OCT-provided parameters and SAP variables. The strongest correlation for the visual field indices was observed between MD and inferior RNFL quadrant thickness (r = 0.592). Correlations were stronger, between inferior RNFL parameters and superior hemifield threshold values. Conclusions: Mild to moderate correlations were found between most OCT and SAP parameters in eyes with glaucomatous visual field loss.

P76

DIAGNOSTIC ABILITY OF SCANNING LASER POLARIMETRY TO DETECT RETINAL NERVE FIBER LAYER DEFECTS IN PATIENTS WITH SUSPECTED GLAUCOMA

L.E. Pablo1, A. Ferreras1, A.B. Pajarín2, P. Fogagnolo1, J.M. Larrosa1, M. Figue1, F.M. Honrubia1

1 Ophthalmology, Miguel Servet University Hospital, Zaragoza, Spain, 2 Family Medicine, Euroresidencia, Zaragoza, Spain

Purpose: To determine the diagnostic ability of scanning laser polarimetry (SLP) to detect retinal nerve fiber layer defects in patients with glaucomatous optic nerve head morphology. Methods: This prospective study included 62 controls and 30 glaucoma suspects. Glaucoma suspects had normal standard automated perimetry (Humphrey Field analyzer, model 750, SITA Standard 24-2 strategy; Zeiss Humphrey Systems, Dublin, Ca) and outside normal limits Moorfields regression analysis (overall classification), evaluated with the Heidelberg retina tomograph 3 (Heidelberg Engineering, Heidelberg, Germany). Only one eye per participant was randomly selected. All of them underwent SLP with the GDx with variable corneal compensation (GDx-VCC; Carl Zeiss Meditec, Inc, Dublin, CA). Sensitivity-specificity pairs and the areas under the receiver operating characteristic curves (AUCs) were calculated and compared between healthy and glaucoma suspects. Results: The mean age was 57.8 ± 11.2 years for the control group and 61.1 ± 10.1 years for the glaucoma suspect group (p = 0.845). TSNI standard deviation (0.815, standard error [SE]: 0.045), nerve fiber indicator (NFI; 0.801, SE: 0.049), and superior normalized area (0.790, SE: 0.054) had the greatest AUCs. There were no significant differences between these AUCs. At 85% fixed specificity, sensitivities were 53.3% for TSNI standard deviation, 60.0% for NFI, and 62.5% for superior normalized area. Conclusions: There are retinal nerve fiber layer changes at early stages of the disease that can be quantified by means of SLP.

P77

ASSESSMENT OF RETINAL NERVE FIBRE LAYER THICKNESS BY SCANNING LASER POLARIMETRY (GDxVCC) IN NORMALS, POAG SUSPECTS AND EARLY POAG PATIENTS

R. Gadia, T. Dada, R. Sihota

Glaucoma Facility, Dr Rajendra Prasad Centre for Ophthalmic Sciences, AIIMS, Newdelhi, India

Purpose: To evaluate the ability of scanning laser polarimetry with variable corneal compensation (GDxVCC) to detect differences in retinal nerve fiber layer (RNFL) thickness between normal, primary open angle glaucoma (POAG) suspects and early POAG.

Method: One hundred thirty eyes of normal subjects (normal disc with normal visual fields), 80 eyes of POAG suspects and 80 eyes of early POAG patients were evaluated using GDxVCC. RNFL parameters were measured on GDx-VCC. TSNI average, superior average, inferior average and NFI were evaluated.

Results: The TSNI average (µm) in normal subjects, POAG suspects and early POAG were 54.17 ± 4.60, 49.76 ± 6.54 and 46.92 ± 6.23 respectively. All the parameters of GDx-VCC were able to distinguish clearly between early POAG and normals (p < 0.001) with NFI having highest AUC of 0.920 and
**P78**

**OCT - SHOULD WE ADJUST THE SCAN DIAMETER TO THE DISC SIZE IN THE EVALUATION OF RETINAL NERVE FIBRE LAYER?**

T. Gomes¹, F. Vaz², J. Seguro³, E. Guerra¹, A. Fonseca¹, P. Pêgo², F. Esperancinha², G. Almeida², I. Prieto², A. Aguilar¹

¹ Centro Oftalmológico de Lisboa, ² Hospital Fernando Da Fonseca, Amadora, Portugal

**Purpose:** To evaluate the change of retinal nerve fibre layer (RNFL) thickness, measured with (OCT), using scan diameters adapted to the optic disc size, in order to maintain the same distance to the disc border.

**Methods:** The optic disc vertical diameter was measured in 287 eyes of 287 patients with Glaucoma or Glaucoma Suspect, by means of Fast Optic Disc acquisition protocol, and the mean value was calculated. To the 10 discs with the largest and the 10 discs with the smallest diameter, a circular scan was adjusted to the size of the optic disc, in order to maintain the same distance to the disc border, as it was obtained in the average ones. RNFL thickness was measured with this new diameter, and values of superior, inferior and total average, were compared with the ones previously obtained with the standard Fast RNFL Thickness protocol.

**Results:** For the 10 patients with the largest discs, the RNFL thickness values measured with the Fast RNFL Thickness protocol (superior, inferior and total average) were respectively 119.2 ± 7.1 µm; 110.9 ± 5.9 µm and 92.8 ± 5.2 µm; the values measured with the scan adjusted to the size of the optic disc were lower, respectively 86.3 ± 7.9 µm; 91.9 ± 8.8 µm; 72.2 ± 5.4 µm. This difference (Linear Mixed Model, SPSS 14.0) is statistically significant (p < 0.001). For the 10 patients with the smallest discs the difference was not statistically significant.

**Conclusion:** If a fixed diameter circular scan is employed, the distance between the scan and the optic nerve head (ONH) will be reduced in the presence of a large ONH, leading to an overestimation of RNFL thickness. It might become necessary to individually adjust the analysis of RNFL thickness according to ONH size so we can always measure RNFL at the same distance from ONH border.

**P79**

**AGREEMENT ANALYSIS OF OPTICAL DISK AND CFNR MEASUREMENTS WITH HRT III IN OCULAR HYPERTENSIVE PATIENTS**

J. Guzman Blazquez, D. Dacosta Ballesteros, C. Pizzamiglio Martin, T. Perez Martinez, P. Beneyto Martin, P. Morente Matas

Hospital Virgen De La Salud, Toledo, Spain

**Purpose:** Our aim is to evaluate the degree of agreement between the Moorfields regression analysis (MRA), a test that requires the user to draw up the margins of the optic disc, and glaucoma probability score (GPS), which do not require the user’s intervention.

**Methods:** Cross-sectional study which included 30 consecutive eyes in 16 patients (8 men, 8 women) diagnosed with ocular hypertension which met the following inclusion criteria: IOP corrected by pachymetry of ≥ 21 mmHg in at least two separate visits, along with normal optic nerve funduscopy exploration by 2 masked glaucoma specialists and TOP perimeter without glaucomatous defect. Both MRA and GPS, classify the rim area both global and by sectors as within normal limits, borderline or out of normal limits. Also exploration with HRT III should have an overall assessment of the image as acceptable or better. The concordance degree was determined making a comparison in every eye of the MRA and GPS classification both global and by sectors (temporal, superior and inferior or temporal, nasal, superior and inferior nasal). Bland Altman charts were used to assess agreement.

Results: 16 eyes (53.33%) had agreement in the overall classification between MRA and GPS, 14 (46.67%) where discordant. 11 eyes (36.67%) were classified on a global basis as within normal limits, 2 (6.67%) as borderline and 3 (10%) as outside normal limits by both tests. 5 eyes (16.67%) were classified as within normal limits by MRA and borderline by GPS; 3 (10%) were classified as borderline by MRA and outside normal limits by GPS. 13 eyes were classified as outside normal limits in the temporal sector by GPS and the same number of eyes was determined as outside normal limits in the nasal sector. None of the eyes was classified as outside normal limits in the temporal sector by MRA and 3 in the nasal sector.

**Conclusions:** Other authors found a higher match rate than the one in our study in healthy patients as well as in glaucoma patients, possibly because of a more reliable diagnosis as in our study we can not rule out that there were patients with pre-perimetric glaucoma. There is a disagreement in the global classification of MRA and GPS for ocular hypertensives and GPS tend to detect as outside normal limits defects that MRA detect as within normal limits. Additional studies are needed with a broader sample.

**P80**

**GLAUCOMAUS RETINAL NERVE FIBRE LAYER DEFECTS AS ASSESSED BY STRATUS OPTICAL COHERENCE TOMOGRAPHY**

J.L. Hougaard

Department of Clinical Sciences, Ophthalmology, Malmö University Hospital, Lund University, Sweden

**Purpose:** To examine Optical Coherence Tomography (OCT) images in glaucoma patient eyes misclassified by Stratus OCT.

**Methods:** Four out of 62 glaucoma patient eyes were misclassified by the OCT with retinal nerve fibre layer (RNFL) thickness within the 95% normal limit for all standard parameters, using the peripapillary high resolution standard protocol. All eyes had reproducible visual field defects and structural loss on conventional RNFL and/or disc photography. In the 4 eyes, we qualitatively compared conventional 495 nm RNFL photographs with OCT images, both standard processed as they are presented by the OCT, but also raw-data images. In addition, we constructed an alternative method using Matlab® to increase OCT image quality (image averaging) and to define the RNFL.

Results: The Stratus OCT algorithm for definition of the RNFL did not detect RNFL atrophy, not even at the location of a localized RNFL defect identified in all 4 eyes in the conventional RNFL photographs. However, we could identify a localized RNFL atrophy (narrowing of the high signal intensity RNFL) at
the expected location in all 4 eyes in the OCT gray-scale and raw data images, but also in the averaged images in which the atrophy even seemed to be defined by our Matlab program.

Conclusion: The observations suggest that some RNFL defects which seem to be identified in OCT images may be inaccurately detected by the Stratus OCT algorithm which may in part explain that some glaucoma eyes are misclassified by the standard Stratus OCT analyses. Our observations need to be confirmed, but suggest that there is room for further enhancement of the diagnostic ability of OCT in glaucoma.

P81

CHANGES IN RETINAL NERVE FIBER LAYER (RNFL) THICKNESS ACCORDING TO THE DEGREE OF MYOPIA IN PATIENTS WITH GLAUCOMA AND OCULAR HYPERTENSION

I. Kim1, J.W. Kim2, Y.Y. Kim2
1 Department of Ophthalmology, Pochun CHA University College of Medicine, Pundang CHA Hospital, Korea, 2 Department of Ophthalmology, Korea University College of Medicine, Seoul, Korea

Purpose: To evaluate the changes in retinal nerve fiber layer (RNFL) thickness according to the degree of myopia in patients with glaucoma and ocular hypertension.

Setting: Single center retrospective study.

Methods: Ninety-eight patients (165 eyes) diagnosed as glaucoma or ocular hypertension underwent the OCT (optical coherence tomography) and scanning laser polarimetry using variable corneal compensation (GDx-VCC) to analyze the correlation between the degree of myopia and the thickness of the RNFL. Partial correlation coefficient analysis was performed to adjust various factors such as age, laterality, intraocular pressure, and mean deviation from visual field test, which can influence on the RNFL thickness.

Results: The average, nasal, superior, and inferior sectorial RNFL thicknesses measured by OCT were significantly decreased with increasing myopia (p < 0.05). However, RNFL thicknesses measured by GDx-VCC was not significantly correlated with the degree of myopia.

Conclusion: The RNFL thickness measured by OCT was decreased with increasing myopia in eyes with glaucoma and ocular hypertension.

P82

INFORMATIVITY OF STEREOMETRICAL AND INTEGRAL INDICES OF THE ONH TOPOGRAPHICAL STRUCTURE IN PATIENTS WITH GLAUCOMA

A. Kuroyedov, V. Gorodnichy
Mandryka 2nd Central Clinical Hospital, Russia

The aim of our study was the evaluation of informativity and relationship between stereometrical and volumetric indices of topographical ONH structure condition, such as MRA and GPS in patients with glaucoma, depending on the disk size and the stage of the disease.

Materials and methods: We observed 87 patients (159 eyes; 44 women, 43 men, average age 59.3 ± 13.7 years). Among this number 25 healthy persons (39 eyes) constituted the control group. Other patients were divided into three subgroups in accordance with the stage of glaucoma; if a patient had different stages of disease on different eyes, study findings were classified to the corresponding groups. Segment indices of MRA and GPS were analysed, regarding ONH circumference. Global indices (global, MRA/GPS) in patients with small ONH in control group were 1.22 ± 0.13/0.19 ± 0.20; in early glaucoma – 1.11 ± 0.14 / 0.23 ± 0.19; in moderate glaucoma – 0.89 ± 0.14/0.4 ± 0.28. In patients with medium ONH those indices were as follows: in control group – 1.60 ± 0.21/0.35 ± 0.25; in early glaucoma – 1.35 ± 0.24/0.45 ± 0.29; in moderate glaucoma – 1.26 ± 0.27/0.6 ± 0.29; in advanced – 0.80 ± 0.27/0.86 ± 0.11. Statistical evaluation of MRA showed significant correlation between the stage of the disease, ONH size and the extent of the rim alteration in different ONH segments. In the control group correlation between temporal and nasal hemispheres was found to be most informative (p < 0.007 and p < 0.01), as well as immediate alterations it the temporal sector (p < 0.0001 and p < 0.02). Pronounced changes were found in medium ONH. In big ONH statistical probability of alteration between ONH sectors had small informativity, which suggests an equal destruction of the rim in patients with such size of ONH in advanced stage of the disease. The second stage of the study was investigation of statistical correlation (Pearson correlation coefficient): the results of this type of analysis show moderate positive correlation (r = 0.53) between MRA and GPS in patients with II stage and small ONH. In all other cases correlation was non-informative.

Conclusion: Our data suggest, that both indices typically change according to the stage of glaucoma. MRA is informatively valid in transformation from one stage of glaucoma to the other, while GPS results change significantly only in the advanced stages and are highly variable in patients with I stage of the disease in control group.

P83

RETINAL NERVE FIBRE MORPHOMETRY IN OCULAR HYPERTENSION AND EARLY GLAUCOMA USING SPECTRAL DOMAIN OPTICAL COHERENCE TOMOGRAPHY

University Eye Hospital, Erlangen, Germany

Purpose: To investigate the retinal nerve fibre layer thickness (RNFL) with a spectral domain, high-resolution OCT in patients with ocular hypertension (OHT), early and advanced glaucoma in comparison to healthy controls.

Patients and Method: Thirty three healthy controls, 8 patients with OHT (normal visual field, healthy optic disc appearance, IOP > 21 mmHg), 7 preperimetric open angle glaucoma patients (normal visual field, healthy optic disc appearance, IOP > 21 mmHg), 16 patients with perimetric open angle glaucoma (glaucomatous visual field loss and disc atrophy, IOP > 21 mmHg) were investigated using Spectralis HRA+OCT (Heidelberg Engineering, Germany). Segmentation of retinal nerve fibre layer in 32 sectors was performed after export of 3.4 mm diameter circle scans centred on the optic disc. One eye of each patient was selected for statistic analysis. Mean global values as well as sector data were compared using Mann-Whitney-U test.

Results: Normals showed mean RNFL thickness of 88.80 ± 8.35 µm with the inferior sector (112.11 ± 11.80 µm) showing highest values. Patients with perimetric glaucoma demonstrated a significant reduction of RNFL thickness globally (53.60 ± 6.31 µm; p = 0.0001) and in all investigated sectors (p < 0.04), whereas in preperimetric patients RNFL loss occurred predominantly in the temporal inferior, temporal horizontal and temporal superior sector. OHT showed only a trend, but no significant reduction of RNFL thickness. Interestingly RNFL loss was as pronounced in the papillo-macular bundle as in the superior temporal sector in all glaucomas.

Conclusion: Spectral domain OCT allows fast and high resolution assessment of the retinal nerve fibre layer. Significant reduction (17-22 %) of RNFL was detected in early glaucoma before visual field loss occurred. Retinal nerve fibre loss was
more pronounced in the temporal inferior, followed by the papillary RNFL thicknesses, as primary glaucoma stages.

P84
COMPARISON OF OPTIC NERVE HEAD CONFIGURATION BETWEEN NORMAL TENSION GLAUCOMA AND PRIMARY OPEN ANGLE GLAUCOMA BY HEIDELBERG RETINA TOMOGRAPH III
N. Lee1, K. Ju1, C. Park1, S. Hyung2, K. Uhm3, J. Moon1, M. Ahn1, N. Baek1
1 Department of Ophthalmology, College of Medicine, The Catholic University of Korea, College of Medicine, Seoul, Korea, 2 Chungbuk National University Hospital, Cheongju, Korea, 3 Hanyang University, Seoul, Korea

Purpose: Primary glaucoma is considered to be one of the most serious eye diseases. There is a general effort to develop new therapeutic techniques. According to our good experience with irradiation of ciliary body in cases of secondary glaucomas by Leksell Gama Knife Surgery (LGKS) we are now focusing our attention to primary glaucoma treatment by this technique.

Method: Patient, female, 63-years-old, underwent glaucoma treatment for 9 years. Medication started by betablockers (0.5% Timolol) at intraocular pressure (IOP) 30 mmHg. Her visual acuity was 1.0 + 0.75D, C/D ratios 0.3, both eyes. No apparent glaucoma changes were approved by laser scan exams. After the treatment, IOP decreased on acceptable level. Still, the chronic conjunctivitis and irregularities of tarsal conjunctiva of upper lid because of allergy dominated in the clinical picture. Even after medication was changed (gradually Betoptic S, Xalatan, Travatan, Vistagan) the situation did not improve. Patient did not agree with further laser and/or surgical procedure.

Results: In spite of the fact the patient stood badly the local medication for many years, we were not allowed to carry out any of the conventional procedures. In the end, we indicated ciliary body irradiation treatment by Leksell Gama Knife (Elekta Instruments AB). Procedure was carried out according to the irradiation protocol described before (J Neurosurg 102: 214-219, 2005), glaucoma medication was stopped. Visual functions have been stable.

Conclusion: By irradiation of ciliary body by the LGKS the compensation of IOP was reached and besides it was possible to fully stop glaucoma medication which was hardly tolerable. In appropriately identified case we consider the LGKS to be a significant instrument that improves quality of life in glaucoma.

P85
CORRELATION OF MACULAR AND PERIPAPILLARY RETINAL NERVE FIBER LAYER THICKNESS AND VISUAL FIELD CHANGES IN OPEN ANGLE GLAUCOMA PATIENT
J.H. Lee1, S.M. Hyung2, K.R. Choi2, K.W. Lee1, Y. Sohn3, J. Moon4, N. Baek6
1 Department of Ophthalmology, Inje University Sanggye Paik Hospital, Seoul, Korea, 2 Department of Ophthalmology, School of Medicine, Chungbuk National University, Chungbuk, Korea, 3 Department of Ophthalmology, Ewha Womans University, College of Medicine, Seoul, Korea, 4 Department of Ophthalmology, Cheil Eye Hospital, Daeung, Korea, 5 Department of Ophthalmology, Kim’s Eye Hospital, Myung Gok Eye Research Institute, Seoul, Korea, 6 Department of Ophthalmology, The Catholic University of Korea, College of Medicine, Seoul, Korea

Purpose: This study was performed to evaluate the macular and peripapillary retinal nerve fiber layer (RNFL) thicknesses, as measured by optical coherence tomography (OCT), and to evaluate their association with glaucomatous visual field change.

Methods: A total of 190 eyes from 116 subjects were classified into six groups: 40 normal eyes, 30 ocular hypertension eyes, 30 pre-perimetric glaucoma eyes and 90 open angle glaucoma eyes (30 early defect eyes, 30 moderate defect eyes and 30 severe defect eyes, as determined by the severity of the visual field defect). We measured the macular and peripapillary RNFL thicknesses by OCT and we performed visual field tests via Humphrey’s automated perimetry.

Results: In the six groups, the macular thickness showed a significant difference in all areas of the macula except the fovea (p < 0.01), and the peripapillary RNFL thickness also showed a significant difference in all areas (p < 0.001). Further, there was a significant decrease of both the macular (p<0.05) and peripapillary RNFL thickness (p < 0.001) in the open angle glaucoma group compared with the normal group (p < 0.05). There were a significant positive relationship between the mean deviation (MD) and all areas of the peripapillary RNFL thickness (R = 0.554, p < 0.001), between the MD and all areas of the macular thickness except the fovea (p < 0.05), and there were a positive relationship between the MD and the mean peripapillary RNFL thickness (R = 0.513, p < 0.001) and between the MD and the mean macular thickness (R = 0.513, p < 0.001). The mean macular thickness was significantly thinner as the mean peripapillary RNFL thickness became thinner (R = 0.495, p < 0.001). The inner ring (p < 0.026), outer ring (p < 0.001) of macular thickness and peripapillary RNFL thickness (< 0.001) were significantly decreased in the lower half as compared with the upper half in 20 eyes that showed upper visual field defect only.

Conclusion: The macular and peripapillary RNFL thicknesses, as measured by OCT, were significantly decreased and this showed a significant association with the visual field change in open angle glaucoma patients. Accordingly, the macular thickness may also be an important clue, along with the peripapillary RNFL thickness, for making the diagnosis of open angle glaucoma.

P86
ABILITY OF STRATUS OCT TO DETECT PROGRESSIVE RETINAL NEVER FIBER LAYER ATROPHY IN GLAUCOMA
E.J. Lee, T. Kim
Department of Ophthalmology, Seoul National University College of Medicine, Korea

Purpose: To evaluate the ability of Stratus optical coherence tomography (OCT) to detect small progressive glaucomatous retinal nerve fiber layer atrophy visualized in the retinal nerve fiber layer (RNFL) photography.

Methods: The study retrospectively reviewed data from 22 eyes of 21 subjects with progressive retinal nerve fiber layer atrophy clearly visualized on the red-free RNFL defect. The sensitivity and specificity of various OCT RNFL thickness parameters for identifying progressive RNFL atrophy was determined. In addition, the topographic relationship between the OCT-measured RNFL thickness change and the progressive RNFL atrophy according to RNFL photography was examined.

Results: The sensitivity of the various Stratus OCT RNFL thickness parameters tested ranged from 27.3% to 95.6%. The highest sensitivity was yielded using a criterion of ≥ 10% change in ≥ 1 clock hour from baseline, and had specificity of 62.9%. The OCT-measured RNFL thickness change showed excellent topographic agreement with the progressive RNFL atrophy visualized in the RNFL photography.

Conclusions: Stratus OCT may detect progressive RNFL atrophy with high sensitivity and moderate specificity. This data suggest that Stratus OCT may be useful as one of the monitoring tools to detect glaucoma progression. However, it appears that Stratus OCT has limited applicability as the sole test for monitoring glaucoma progression because of insufficient specificity.
RESULTS: Visualization of the TDM was possible in all eyes. Two groups could be distinguished based on the morphology of the TDM: Group 1 (6 eyes). The TDM was characterized by the presence of an area of epithelial cells in the deep stromal level. After goniopuncture, an opening at the site of the TDM with dispersed epithelial cells was clearly visible. Group 2 (5 eyes). A fibrotic tissue overlying the TDM was observed in all cases. No openings were visible after goniopuncture. Group 1 had a statistically significant IOP decrease 15 minutes following goniopuncture (20.6 ± 3.5 mmHg before versus 12.6 ± 3.1 mmHg after, p < 0.05) while there was no significant change in Group 2 (19.2 ± 4.3 mmHg before versus 20.8 ± 7.5 mmHg after). Conclusions: In vivo confocal microscopy allows visualization of the TDM. This technique may be valuable in predicting the efficacy of Nd:YAG goniopuncture in patients with elevated IOP after deep sclerectomy. The presence of a fibrotic tissue covering the TDM is associated with failure of goniopuncture.

P89
CORNEAL ENDOTHELIAL CELL LOSS AND IN VIVO VISUALISATION OF THE AHMED GLAUCOMA VALVE IMPLANT. EVALUATION WITH MODERN ANTERIOR SEGMENT IMAGING TECHNIQUES
T. Shaarawy, A. Dosso, E. Mendrinos
Department of Ophthalmology, Geneva University Hospitals, Switzerland

Purpose: To report corneal endothelial cell loss and visualisation of the Ahmed Glaucma Valve Implant in eyes with refractory glaucoma.

Methods: Seven eyes underwent Ahmed valve implant surgery and were followed-up prospectively for 12 months. In vivo confocal microscopy (Rostock Cornea Module/Heidelberg Retina Tomograph II, HRT II) was used to measure the central and peripheral corneal endothelial cell density. Anterior Segment-Optical Coherence Tomography (AS-OCT) was used to assess the intracameral length of the drainage tube (ICL) and the distance between the tube and the cornea (T-C), and the iris (T-I). Measurements were performed preoperatively (baseline) and at months 3, 6 and 12 after surgery.

Results: At 3, 6 and 12 months following surgery, mean central corneal endothelial loss was 5%, 6% and 12% respectively compared to baseline (p > 0.05). At these time-points, mean peripheral corneal endothelial cell loss was 4%, 5% and 7% (p > 0.05). Mean ICL, T-C and T-I distances were 2.5 ± 0.2 mm, 1.2 ± 0.5 mm and 0.3 ± 0.4 mm respectively at the day of surgery. No significant changes were observed in these parameters during the follow-up period (p > 0.05).

Conclusions: Ahmed valve implant surgery is not associated with a significant endothelial cell loss, at least in short-term. Moreover, the drainage tube into the anterior chamber maintains a stable position. AS-OCT and HRT II are promising imaging techniques for the follow-up of patients with a glaucoma drainage device.
nerve fiber layer thickness measurement by Stratus OCT III in patients with glaucoma and ARMD, with one eye treated with photodynamic therapy.

Methods: Prospective analyze of 34 patients (age 51-82 years, average 70.24.), with glaucoma and ARMD in both eyes and after photodynamic therapy (PDT) propter subfoveal CNV in wet ARMD only in one eye. There were, We divided eyes on two groups. Group A - 34 eyes after PDT, and group B - 34 eyes without PDT. Ocular pressure in both eyes between 10 and 21 mmHg with anti-glaucoma pharmacological monotherapy. BCVA ETDRS between 0.9 and 0.4. All patients have between 2 and 4 PDT (average 3.06) only in one eye. Stratus OCT III were used to measure retinal nerve fiber layer thickness in four quadrants. We used protocol Fast RNFL Thickness (3.4). Measurements of NRFL were taken before PDT and 12 months after PDT.

Results: Before PDT: Group A, NRFL average thickness: temp. quadrant – 64.03 (± 1.21) µm; superior – 102.70 (± 2.73) µm; nasal – 71.47 (± 6.05) µm; inferior – 123.94 (± 1.28) µm; all quadrants together – 91.68 (± 1.28) µm. Group B, NRFL average thickness: temp. quadrant – 68.70 (3.39) µm; superior – 113.97 (± 2.63) µm; nasal – 67.21 (± 5.51) µm; inferior – 120.06 (± 3.98) µm; all quadrants together – 92.09 (± 2.01) µm. After 12 months: Group A, NRFL average thickness: temp. quadrant – 64.06 (± 2.39) µm; superior – 99.38 (± 2.16) µm; nasal – 70.91 (± 5.62) µm; inferior – 115.88 (± 1.98) µm; all quadrants together – 87.37 (± 1.82) µm. Group B, NRFL average thickness: temp. quadrant – 64.67 (± 2.1) µm; superior – 114.18 (± 1.92) µm; nasal – 68.26 (± 5.92) µm; inferior – 114.71 (± 1.88) µm; all quadrants together – 90.64 (± 1.69) µm. Difference between group A and B before PDT were statistically significant in temp. quadrant (p < 0.05), superior (p < 0.05), nasal (p = 0.0017) and inferior (p < 0.05) but not statistically significant in all quadrants together (p = 0.1585). After PDT statistically significant difference between group A and B before PDT were in all quadrants together (p < 0.05), superior quadrant (p < 0.05), nasal (p = 0.034), inferior (p = 0.007) but not statistically in temporal quadrant (p = 0.1586).

Conclusions: Statistically significant difference in all quadrant together, between group A (glaucoma and PDT in CNV ARMD) and group B (only glaucoma and ARM) may mean that CNV and photodynamic therapy destroy more nerve fiber layer than only glaucoma.

P91

AGREEMENT AMONG RISKS OF DEVELOPING GLAUCOMA CALCULATED USING VERTICAL CUP-TO-DISC RATIOS DETERMINED BY STEREOSCOPIC PHOTOGRAPHY, HRT AND OCT

A. Fernandez-Vidal, F. Saenz-Frances, C. Mendez-Hernandez, J.M. Martinez-de-la-Casa, E. Hernandez-Garcia, M. Elias-de-Tejada, J. Garcia-Sanchez, J. Garcia-Feijoo
Hospital Clinico Universitario San Carlos, Madrid, Spain

Objectives: to assess agreement among risks of developing glaucoma estimated according to the vertical cup-disc ratios (V-CDR) indicated by the methods stereoscopic photography, HRT and OCT.

Materials and methods: the validated risk calculation method used takes into account the variables: IOP, central corneal thickness, visual field loss variance (as determined by Octopus tG1x perimetry), age and V-CDR. Glaucoma risks were calculated in 27 subjects with high intraocular pressure (IOP) using V-CDR values determined through visual inspection of stereoscopic photographs, HRT and OCT. We assessed correlations between risks corresponding to the three V-CDR estimation methods (linear regression) and differences between these risks (Student t-test).

Results: in 36% of the subjects, differences among V-CDR determined by stereoscopic photography and HRT were equal to or less than 0.2, while a similar difference for stereoscopic photography versus OCT was only detected in 28% of the individuals. Correlations between risks were 0.865 (p < 0.001) for stereoscopic photography versus OCT and 0.851 (p < 0.001) for stereoscopic photography versus HRT. Mean risks based on stereoscopic photography, OCT and HRT were 10.1 ± 2.17 ± 13.1 and 15.6 ± 13.1 respectively. Significant differences emerged when we compared risks based on V-CDR estimates made by stereoscopic photography versus HRT or OCT (p < 0.001 photos-OCT; p = 0.001 photos-HRT).

Conclusions: the risk calculation method used is a diagnostic tool that provides an automatic evaluation of the risk of developing glaucoma; however its measurements vary significantly depending on which method (OCT, HRT or stereoscopic photography) is used to determine V-CDR.

P92

THE CORRELATION BETWEEN HUMPHREY MATRIX FREQUENCY DOUBLING PERIMETRY AND STANDARD AUTOMATED PERIMETRY IN GLAUCOMA PATIENTS

N. Yildirim, A. Sahin, H. Erdogan, H. Basmak
Eskisehir Osmangazi University Medical School Department of Ophthalmology, Turkey

Purpose: To find out the correlation between visual field indices obtained by second-generation Frequency Doubling Technology (FDT) perimetry and Standard Automated Perimetry (SAP) in glaucoma patients and suspects.

Subjects-Methods: One hundred fifty five eyes of 155 glaucoma patients and glaucoma suspects were included in this study. All patients enrolled in the study had a best-corrected acuity of 0.5 or better and had prior experience with perimetry. SAP was performed with a Humphrey Field Analyser (HFA) 750ii series (Carl-Zeiss Meditec, Dublin CA, USA) using the SITA-Standard 30-2 program. FDT 30-2 perimetry was performed with a Humphrey Matrix 715 series (Welch Allyn, Skaneateles Falls, NY, USA and Carl-Zeiss Meditec). Visual field indices that were compared were as follows: test duration, mean deviation (MD), pattern standard deviation (PSD), visual field loss in hemifields and quadrants. Data were analyzed using Pearson's correlation coefficient and paired t-test. p < 0.05 was considered significant.

Results: The mean ± SD age of participants was 53.8 ± 11 years (range 37-81). Mean test duration for FDT was 391 s (6 min 31 s), which was 1 min shorter than the mean duration of the SAP tests (7 min 33 s; 453 s). The mean ± SD MD of the FDT tests (-1.39 ± 3.64 dB) was significantly lower than that of HFA (-3.44 ± 2.69 dB) (p < 0.0001) with a correlation of 0.59. When comparing pattern standard deviation (PSD), the mean ± SD PSD for Humphrey Matrix (3.33 ± 1.39 dB) was higher than that of HFA (2.74 ± 2.11 dB) (p < 0.0001) with a correlation of 0.72. The correlation for the superior hemifield was 0.58, which was stronger than the correlation of 0.46 for the inferior hemifield. The correlation coefficients were 0.63, 0.58, 0.31, and 0.49 for superotemporal, superonasal, inferotemporal, and inferonasal quadrants, respectively. The strongest correlation (0.63) was seen between superotemporal quadrants.

Conclusion: This study shows that FDT, which has shorter test duration, correlates well with SAP in terms of all visual field indices but the most significant correlation was seen in PSD and superotemporal quadrant.
Mean preoperative foveal thickness was 177.4 microns (SD 18.7). The mean foveal thickness one week postoperatively was 188.2 microns (SD 22.5), at an average of 5 weeks postoperatively was 195 microns (SD 28.4), and at an average of 13 weeks postoperatively was 189.4 microns (SD 22.3). No statistically significant difference between pre and postoperative foveal thickness was demonstrable. None of the patients developed clinical evidence of cystoid macular oedema.

Conclusion: These results help to validate the increasing use of cyclodiode laser treatment produces changes in macular thickness and cystoid macular oedema measured by optical coherence tomography (OCT).
Purpose: To evaluate reproducibility of retinal nerve fiber layer (RNFL) analysis obtained with Stratus OCT III (Zeiss Meditec) in patients with low vision and impaired fixation in whom reliable results seem to be most difficult to acquire. Methods: 30 eyes (15 patients) in a prospective 3 months study. Best corrected visual acuity (BCVA) by means of ETDRS chart: mean logMAR score 0.83 ± 0.15. Low BCVA and impaired fixation was due to age-related macular degeneration and choroidal neovascularization or geographic atrophy. Patients were chosen with no history of glaucoma or other optic nerve pathology. Inclusion criteria included retinal nerve fiber layer thickness within normal range and both eyes similarly affected by AMD (no more than 10 letters difference in ETDRS charts between eyes) – to avoid possibility of external fixation. During study OCT was performed 5 times by the same qualified technician. Fast RNFL acquisition protocol and RNFL Average Thickness analysis were used to obtain quantitative parameters. Coefficient of variation (CV%) was calculated for average, superior average, inferior average, superior maximum, inferior maximum, inferior average, superior average, maximum RNFL thickness in all patients.

Results: Average RNFL thickness / Inferior average thickness / Superior average thickness / Inferior maximum thickness / Superior maximum thickness were respectively: 99.04 ± 16.27 / 125.53 / 23.61 / 120.89 / 23.49 / 153.13 ± 26.53 / 162.58 ± 26.87. Average RNFL thickness / Inferior average thickness / Superior average thickness / Inferior maximum thickness / Superior maximum thickness / mean CV% were respectively: 4.34 / 5.9 / 6.28 / 4.72 / 5.9. Mean signal strength was 8.83 ± 1.14.

Conclusions: RNFL analysis in patients with low BCVA and impaired fixation should be interpreted with caution. However, all mentioned measurements seem to be satisfactorily reproducible. Average RNFL thickness is the most reproducible measurement, with surprisingly low CV% value. It means that even in such patients RNFL analysis by means of OCT is very useful. Actual progression of RNFL thinning should be taken into consideration if subsequent exams reveal worsening when compared to baseline.

Purpose: To correlate the central corneal thickness (CCT) and the retinal nerve fiber layer (RNFL) thickness parameters measured by nerve fiber analyzer (NFA) to detect the progression of glaucoma in patients with ocular hypertension (OHT).

Methods: Fifty-one eyes with OHT and ninety-two normal eyes were included in the study. Both groups were divided into three subgroups such as the patients having CCT less than 555 μm, patients with CCT measurements between 555 and 588 μm, and the patients with CCT measurements more than 588 μm based on OHT study findings. The RNFL thickness (the number, symmetry, superior ratio, inferior ratio, superi/or/nasal, maximum modulation, superior maximum, inferior maximum, average thickness, ellipse modulation, superior average, inferior average, ellipse average, superior integral) was assessed with a scanning laser polarimeter (Nerve Fibre Analyzer GDx, Laser diagnostic Technologies Inc., San Diego, CA, USA). CCT was measured by ultrasonic pachymetry. We also examined the relationship of GDx VCC measurements and age, IOP, SAP pattern standard deviation.

Results: In the OHT group, inferior average value was statistically significant in patients having CCT ≤ 555 μm compared to patients having CCT ≥ 588 μm. The ellipse modulation value was statistically significant in between the subgroups of patients with CCT measurements between 555-588 μm, and the patients with CCT measurements ≥ 588 μm. In patients having CCT less than 555 μm, the ellipse modulation value was statistically significant in eyes with intraocular pressure (IOP) > 24 mmHg compared to the eyes with IOP ≤ 24 mmHg. Superior and inferior ratios were significantly different in the patients with CCT measurements between 555 and 588 μm when grouped as eyes with IOP > 24 mmHg and eyes with IOP ≤ 24 mmHg.

Conclusions: Symmetry value was significantly different in comparison of all subgroups of ocular hypertensive eyes with control eyes indicating an early damage detected by NFA. However, no direct correlation was found between CCT measurements and nerve fiber thickness parameters which were analyzed by a NFA without corneal compensation. Ocular hypertensive eyes with thinner corneas had thinner inferior retinal nerve fibers compared to ocular hypertensive eyes with thicker corneas.
Purpose: To compare the relationship between retinal nerve fiber layer thickness (RNFL) and optic nerve head (ONH) parameters measured with optical coherence tomography (OCT) with the Scoring Tool for Assessing Risk (STAR) threshold in patients with ocular hypertension (OH).

Design: Prospective randomized clinical trial.

Participants: The study included 92 patients with OH. They were divided into low- (n = 32), moderate- (n = 36), and high-risk (n = 24) groups according to STAR criteria.

Methods: RNFL and ONH OCT protocols were used to evaluate all study participants. Major parameters for RNFL analysis were average RNFL thickness, superior quadrant, nasal quadrant, inferior quadrant, temporal quadrant, and segmental thickness per 12 o’clock hour Position. ONH parameters were vertical integrated rim area (VIRA), horizontal integrated rim width (HIRW), disc diameter, disc area, cup area, rim area, cup-to-disc (C/D) area ratio, horizontal C/D ratio, and vertical C/D ratio. The sensitivity and specificity of OCT parameters, and the area under the receiver operating characteristic (AROC) curves for the groups were determined.

Results: The highest AROCs for distinguishing the high-risk group from the other groups were vertical C/D ratio (0.88), C/D area (0.88), VIRA (0.87), and HIRW (0.81) for ONH parameters, and inferior (0.82) and 6 o’clock hour position (0.77) for peripapillary RNFL thickness measurements.

Conclusions: Inferior average, 6 o’clock hour position analyzes for RNFL measurement, and VIRA, HIRW, C/D area, and vertical C/D ratio for ONH measurement were the best parameters for STAR staging in patients with OH.

P102

THE STRATUS OCT SENSITIVITY FOR A LOCALIZED RETINAL NERVE FIBER LAYER DEFECT ACCORDING TO ITS CLOCK HOUR LOCATION

Y.C. Yoo1, J.Y. Kim1, K.H. Park2

1 Department of Ophthalmology, Gangdong Sacred Heart Hospital, Hallym University College of Medicine, 2 Department of Ophthalmology, Seoul National University College of Medicine, Korea

Purpose: To study the effect of clock hour location of localized retinal nerve fiber layer (RNFL) defect on the sensitivity of Stratus optical coherence tomography (OCT) with its internal normative database.

Methods: Ninety nine eyes of 99 subjects with a localized RNFL defect, which was identified on a red-free photography, were tested with Stratus OCT. Among 13 parameters of fast RNFL thickness analysis, those abnormal at the 5% level were evaluated. The best parameter was compared between two groups with a differently placed RNFL defect.

Results: The localized RNFL defect was located at either superotemporal (n = 39) or inferotemporal clock hour (n = 60). The mean angular width (28.1 ± 6.4 degree) of inferotemporal defects was significantly larger than that (21.6 ± 5.7 degree) of superotemporal defects (independent t test, p = 0.04). Among evaluated parameters, sector average was the best parameter to detect a localized RNFL defect. Although the sector average showed higher sensitivity in the detection of inferotemporal defect than in superotemporal defect (Fisher’s exact test, p = 0.004), subgroup analysis according to the degree of RNFL defect width did not show any difference in the sensitivity (Fisher’s exact test, p > 0.05).

Conclusion: The clock hour location of localized RNFL defects around optic disc did not affect significantly the sensitivity of Stratus OCT. The lower sensitivity of Stratus OCT for superotemporal RNFL defects may be due to their smaller angular width compared with that of inferotemporal RNFL defects.
**Poster Session 10**

**MANAGEMENT: INTRAOCULAR PRESSURE**

**P103**

**COMPARISON OF DIURNAL IOP LOWERING EFFECT OF SELECTIVE TRABECULOPLASTY (SLT) AND LATANOPROST**

M. Morion1, J. Benitez-del-Castillo1, J.A. Lopez2, T. Regil1, I. Mota1

1 Hospital General S.A.S. de Jerez, 2 Hospital Universitario Virgen de las Nieves de Granada, Spain

Purpose: To compare IOP lowering efficacy in diurnal curve between selective trabeculoplasty (SLT) and latanoprost.

Methods: A prospective case series study of 16 eyes from 8 patients (ocular hypertensives and glaucoma) under latanoprost monotherapy. Diurnal curves were done and patients underwent SLT 360° withdrawing topical medication. Diurnal curves were done again after 2 months follow-up after SLT and data were compared. Results are analysed with Wilcoxon test for paired samples.

Results: Median from mean diurnal IOP with latanoprost was 15.6 mmHg (95% CI 14.9 to 16.6) and median from mean diurnal IOP post SLT is 16.1 mmHg (95% CI 15.6 to 17) and there is not statistically significant difference (p = 0.09). Highest mean diurnal IOP value with latanoprost is 18.3 mmHg (SD 1.5) and with SLT is 18.5 (SD 2). There is not statistically significant difference between medians (p = 0.85). Lowest mean diurnal IOP value with latanoprost is 13.5 mmHg (SD 1.1) and with SLT is 14 (SD 1.2). There is not statistically significant difference between medians (p = 0.3). Mean IOP diurnal difference with latanoprost is 4.8 mmHg (SD 2) and with SLT is 4.5 (SD 1.5). There is not statistically significant difference between medians (p = 0.49).

Conclusion: SLT and latanoprost show a similar efficacy in diurnal fluctuation IOP control.

**P104**

**LONG-TERM EFFICACY AND SAFETY OF A STAINLESS STEEL GLAUCOMA DRAINAGE DEVICE IMPLANTED UNDER A SCLERAL FLAP**

G. Bricola, F. De Feo, R. Scotto, A. Bagnis, C.E. Traverso

Ophthalmology, D.I.N.O.G., University of Genoa, Italy

Purpose: To evaluate the efficacy and safety of a stainless steel miniature glaucoma drainage device (Ex-PRESS™ X200) implanted under a scleral flap for the surgical treatment of primary open-angle glaucoma (POAG).

Methods: In this single-centre study the Ex-PRESS™ device was implanted at the limbus under a scleral flap in 37 eyes of 35 patients with POAG. Primary outcome: IOP change. Secondary outcomes: side effects and VA changes.

Results: The efficacy and safety were evaluated on the full sample, with a minimum FU of 12 months (max 24, mean 18). Pre-operative IOP was 27.6 ± 8.7 mmHg; at last follow-up IOP was 12.4 ± 3.4 mmHg (55.1% reduction). The success rate (IOP < 18 mmHg at last visit without medications) was 94.6% (35/37). Early post-operative complications were clinically mild and included: post-operative IOP < 5 mmHg: 12 cases at 1 day, 8 cases at 1 week, 3 cases at 1 month, 1 case at 3 months; serious choroidal detachment: 9 cases, 3 spontaneously resolved, while in 6 cases hypotony and flat chamber were treated with viscoelastic injection in the anterior chamber. At last follow-up 6 patients were treated with 2 IOP lowering medications. No sight-threatening consequences of surgery were observed. There were 8 cases (21.6%, n = 37) of bleb needling, with or without SFU.

Conclusions: Our data support the efficacy and safety of the implantation of this device under a scleral flap (Flap-Ex-PRESS). The IOP reduction obtained was significant, long-standing and complications were minimal. ARVO MEETING.

**P105**

**COMPARISON OF UNSUCCESSFUL RESPONSE BETWEEN SELECTIVE LASER TRABECULOPLASTY AND LATANOPROST IN PRIMARY OPEN ANGLE GLAUCOMA**

R. Bringas, D. Iglesias

Hospital Rio Horta, Spain

Objective: Compare the rate of patients with primary open angle glaucoma who are nonresponders to selective laser trabeculoplasty or treatment with latanoprost 0.005%.

Materials and methods: A retrospective study in which patients with primary open angle glaucoma were included. The first choice of treatment was latanoprost 0.005% or selective laser trabeculoplasty. A total of 60 spots were placed over 180 degrees of the trabecular meshwork at energy level of 0.7 mJ per pulse. We defined lack of response (non-responders) in the event of an intraocular pressure under 20% from basement at the end of the study three months later.

Results: Seventy four eyes were included. Forty three received latanoprost 0.005%. Thirty one eyes received laser treatment. The percentage of non responders in latanoprost group was 18% (8 eyes) and 42% (13 eyes) in trabeculoplasty group (p < 0.0001).

Conclusions: Selective laser trabeculoplasty has been proposed as first line of therapeutic option in primary open angle glaucoma treatment. However, we shouldn’t forget the high percentage of failure in the intraocular pressure control at medium term.

**P106**

**12-MONTH RANDOMIZED CONTROLLED STUDY OF THE EFFICACY AND SAFETY OF 3 BIMATOPROST FORMULATIONS IN PATIENTS WITH GLAUCOMA OR OCULAR HYPERTENSION**

J. Cohen1, L.J. Katz2, A. BatooSingh2, C. Felix2, R. Schiffman3

1 Cincinnati Eye Institute, Cincinnati, OH, USA, 2 Wills Eye Hospital, Philadelphia, PA, USA, 3 Allergan, Inc., Irvine, CA, USA

Purpose: To evaluate the intraocular pressure (IOP)-lowering efficacy and safety of 2 new formulations of topical bimatoprost compared to the commercially available medication.

Methods: This randomized, double-masked, multicenter clinical study enrolled 561 patients with glaucoma or ocular hypertension. Patients were assigned to once-daily treatment with 1 of 3 bimatoprost formulations for 12 months. IOP was evaluated at 8 AM and 12 PM at baseline, weeks 2 and 6, months 3, 6, 9, and 12; and at 4 PM at all visits except month 9. Safety measures included adverse events, biomicroscopy, and macroscopic hyperemia.

Results: 504 patients completed the trial. Efficacy and safety data will be presented.

Conclusions: New formulations of topical ophthalmic medications are important additions to available therapeutic options.
TRABECULAR MICRO-BYPASS STENT FOR REFRACTORY OPEN-ANGLE GLAUCOMA PATIENTS: 18-MONTH RESULTS

F. De Feo¹, S. Gandolfi², F. Honrubia Lopez³, H. Hoh⁴, J. Gargia Sanchez⁵, C.E. Traverso¹
¹ Dinog-Eye Clinic, University of Genova, Genoa, Italy, ² Eye Clinic, University of Parma, Parma, Italy, ³ Servicio de Oftalmologia, Hospital Universitario Miguel Servet, Zaragoza, Spain, ⁴ Eye Clinic, Universitat Neubrandenburg, Neubrandenburg, Germany, ⁵ Eye Clinic, Hospital Clinico Universitario San Carlos, Madrid, Spain

Purpose: To evaluate the efficacy of the iStent Trabecular Micro-Bypass Stent (Glaukos Corp.) in patients with open angle glaucoma, refractory to previously attempted medical and surgical therapies.

Methods: Prospective, open-labeled, 24 month, multi-country evaluation of 45 patients with uncontrolled advanced primary open-angle glaucoma who underwent ab-interno stent implantation. The device reduces aqueous resistance by creating a long-lasting patent bypass between the anterior chamber and Schlemm’s canal. The stent is inserted through a 1.0 mm temporal clear corneal incision. Enrolled patients were required to have undergone previous conventional medical and surgical therapies that failed or were considered to have a poor prognosis for filtration surgery. Thirty patients completed 18 months; results are presented in this interim analysis. Primary end point was achievement of an IOP ≤ 21 mmHg. Secondary end point was reduction in mean medication use.

Results: Mean preoperative IOP was 28.4 (± 6.39) mmHg at baseline and 17.9 (± 3.62) mmHg at month 18 (p = 0.0001). At baseline, the mean number of medications was 2.1 (± 0.94); by month 18 the mean number of medications was 1.2 (± 1.18). This was statistically significant (p < 0.0001). One-third of the patients completing the 18-month evaluation (10 eyes) achieved an IOP ≤ 21 mmHg with no ocular hypotensive medications. Overall, 90% of eyes reached an IOP of ≤ 21 mmHg. The most commonly reported adverse event was trabeculocytome (n = 13). Conclusions: The iStent was safe and efficacious in difficult-to-treat patients who had failed on prior therapy and/or surgery or were considered poor candidates for filtering procedures. This ab-interno procedure resulted in statistically significant reductions in mean IOP and reduced reliance on medications. ARVO MEETING.

EFFICACY, TOLERABILITY AND SAFETY OF THE NEW FIXED COMBINATION OF BIMATOPROST 0.03% AND TIMOLOL 0.5% IN A BROAD PATIENT POPULATION: RESULTS OF A MULTI-CENTER OPEN-LABEL OBSERVATIONAL STUDY

C. Feuerhake¹, P. Buchholz², F. Kimmich³
¹ Private Practice, Lehrte, Germany, ² Allergan Europe, Ettlingen, Germany, ³ Eyecons, Pfinztal, Germany

Purpose: A new fixed combination of bimatoprost 0.03%/timolol 0.5% was introduced in September 2006 in Germany. We conducted a multi-center, observational, open label study to evaluate efficacy, tolerability, and safety of this drug combination.

Methods: Patients with primary open angle glaucoma or ocular hypertension (N = 606) who required a medication change were switched with no wash-out period to once-daily fixed-combination bimatoprost/timolol. IOP readings were recorded at baseline (prior therapy), and 4-6 weeks and 12 weeks after switching. Patient compliance and all adverse events were recorded. Tolerability was measured using a 4 step scale.

Results: 405 patients switched from monotherapy, 97 switched from other fixed combinations, and 104 switched from non-fixed combinations. 48.6% of patients had used prostaglandin analog (PGA) monotherapy, 54.6% had used a fixed-combination that included a PGA, and 40.4% had been using an adjunctive combination of a PGA and a β-blocker. Replacement therapy for 405 patients was fixed-combination monotherapy, 179 patients used 2 agents, and 22 used 3 or more agents. Mean (treated) baseline IOP (+/− SD) for all patients was 20.7 ± 3.5 mmHg. Overall, changing medication to fixed combination bimatoprost/timolol lowered IOP to 16.6 ± 2.7 mmHg after 4-6 weeks, and to 16.1 ± 2.6 mmHg after 12 weeks. Combined bimatoprost/timolol provided an additional IOP decrease versus baseline in all subgroups. At week 12, patients who previously used β-blockers achieved an additional 25.8% decrease from treated baseline. Among all former PGA patients IOP was reduced by 22.6% (to 16.1 ± 2.4 mmHg), with those previously using travoprost achieving an additional 24.5% reduction from treated baseline, 22.7% for prior latanoprost, and 21.3% for prior bimatoprost. Those who had used a latanoprost/timolol fixed combination had a further IOP decrease of 17.5% at week 12. At week 12, 55.9% of all patients, with 60.6% of the prior β-blocker monotherapy subgroup and 50.0% of those from fixed-combination latanoprost/timolol, reaching a target pressure of ≤ 16 mmHg. Tolerability of the bimatoprost/timolol combination was rated excellent or good by the physicians for 98.7% of patients and by 97.0% of the patients themselves. Few adverse events occurred during the treatment period.

Conclusions: Our results show that the fixed combination of bimatoprost 0.03%/timolol 0.5% was effective, well tolerated and safe in a broad patient population.

VISUAL ACUITY FOLLOWING TRANS-SCLERAL CYCLOPHOTOCOAGULATION FOR PRIMARY OPEN ANGLE GLAUCOMA

I. Hanspal, D. Byles
West of England Eye Unit Royal Devon & Exeter Hospital, United Kingdom

Background: Trans-scleral diode laser cyclophotocoagulation (TSCP) is an established treatment for refractory secondary glaucoma and has more recently been advocated in the treatment of medically uncontrolled primary open angle glaucoma (POAG). The effect of TSCP on visual acuity in patients with POAG and good pre-treatment acuity is poorly documented in the literature. We aimed to evaluate the effect of TSCP on patients with good pre-treatment acuity treated for medically uncontrolled POAG.

Methods: We conducted a retrospective case note review of all patients undergoing TSCP for POAG between January 2002 and December 2006. Only patients with a pre-treatment Snellen visual acuity of 6/12 or better were included in subsequent analysis.

Results: Of 43 patients undergoing TSCP 27 patients had a visual acuity of 6/12 or better. The 16 excluded patients all had visual acuities of 6/60 or worse. 15/27 (56%) maintained their visual acuity within 1 line at 1 year. 12/27 (44%) lost more than one Snellen line of acuity. Of these 7 deteriorated by 2 lines, 3 by 3 lines and 2 went from 6/6 to less than 6/60. The mean pre-treatment IOP was 22 mmHg (SE 1.43). Following treatment the IOP at 1, 6 and 12 months were: 14 mmHg (SE 1.49), 13 mmHg (SE 0.94) and 13 mmHg (SE 0.90) respectively (p < 0.001 one-way repeated measures...
P110

THE EFFECT OF CYCLODIOIDE ON INTRAOCULAR PRESSURE (IOP) IN PATIENTS WITH REFRACTORY GLAUCOMA

L.B. Huynh, P. Galloway, P. Brogden
St James’s University Hospital, Leeds, United Kingdom

Aim: To analyse the effect of trans-scleral cycloidee treatment in patients with refractory glaucoma. The study examined the effect on visual acuity (VA), glaucoma medication use and adverse events.

Methods: We prospectively recorded data of 57 treatments of 42 eyes that underwent cycloidee laser treatment for refractory glaucoma at a University Teaching Hospital department between January 2004 and June 2007, with minimum follow up of 6 months. Success was defined as IOP at last index visit of less than 22 mmHg or IOP reduction of greater than 30%. Hypotony was defined as IOP less than 5mmHg at last index visit.

Results: The mean follow up at last index visit was 15.5 months (range 1.4-37.0). The mean (standard deviation) IOP pre-operatively was 38.0 mmHg (12.3), reducing to 24.0 mmHg (12.6) (p = 0.000 Mann-Whitney U) at 3 months post-operative and reducing further to a mean IOP of 19.6 mmHg (10.8) (p = 0.000) at last index visit. A successful outcome as defined by post treatment IOP of less than 22 mmHg occurred following 77% (n = 44) of treatments and a reduction in IOP of 30% or greater following 82.5% (n = 47) of treatments. Mean power settings were 19 shots x 1871 ms x 1577 mw to treat a mean of 270 degrees of the circumference of the ciliary body. The average number of cycloidee treatment sessions required by patients was 1.4 (range 1-4) with 29.8% of patients requiring more than one treatment. Trans-scleral cycloidee was performed on patients with severe ocular pathologies. Pre-treatment 68% of our patients had a VA of 6/60 or poorer, of which 42% were on oral acetazolamide. At last index visit 64% of patients experienced no change in their VA, 4% improved by more than one snellen line and 32% fell by more than one line. Hypotony occurred in one eye following cycloidee for neovascular glaucoma with a pre-operative VA of No perception of light. The mean (SD) anti-glaucoma medication prescribed was 2.9 (1.3, range 0-6) at pre-treatment visit and reduced to 2.0 (1.4, range 0-4) (p = 0.002) at last index visit. 36.8% of patients required oral acetazolamide pre-treatment compared to none at last index visit, resulting in 100% of patients being able to discontinue this medication.

Conclusion: Trans-scleral cycloidee laser treatment is an effective procedure in reducing IOP and glaucoma medication, in particular oral acetazolamide. The risk of decreased vision following cycloidee limits this treatment to patients who have been refractory to other therapies.
IMMUNOHISTOCHEMICAL ANALYSIS OF APOPTOSIS RELATED PROTEINS, P53 AND BCL-2, CONJUNCTIVAL EPITHELIUM TREATED WITH LATANOPROST, TRAVOPROST AND BIMATOPROST IN RABBIT ANIMAL MODEL

C. Pappa1, E. Tsanou1, S. Gorezis1, D. Peschos2, M. Stefaniotou1, M. Aspiotis1

1 Department Ophthalmology, University Hospital of Ioannina, 2 Department of Forensic Medicine, Medical School, University of Ioannina, Greece

Introduction: Many hypotensive molecules have been developed for the medical treatment of glaucoma, such as prostaglandin analogues, that reduce intraocular pressure by increasing the uveoscleral outflow. Prostaglandins have the theoretical potential to stimulate inflammatory and apoptotic pathways. In clinical and experimental studies, it has been shown that long term use of ophthalmic solutions associated with preservative can induce conjunctival stroma infiltration and overexpression of inflammation or apoptosis related molecules. Benzalconium chloride (BAC) is the most commonly used preservative antiglaucoma drugs. Bcl-2 protein is a well known apoptosis inhibitor, that forms heterodimers with apoptosis related genes.

Purpose: To our knowledge, comparative investigation on the apoptotic status of the ocular surface after treatment with different antiglaucoma drugs has not yet been performed. In this study we investigated the effect on apoptotic pathways of long-term glaucoma therapy with commercially available eye drops containing prostaglandin analogues.

Material-method: Specimens were obtained from the bulbar conjunctiva of 30 New Zealand white rabbits. The animals were randomly divided into 3 equally numbered groups treated respectively with latanoprost, travoprost and bimatoprost daily for one year. Left eyes were treated while right eyes were not observed in the comparison between groups (ANOVA).

Conclusion: Consistently high expression levels of antiapoptotic proteins in epithelial conjunctival cells affected by latanoprost, travoprost and bimatoprost might contribute to the restriction of apoptotic cell death induced by all three types of prostaglandin analogues.

A NEW SCORE FOR DETERMINATION OF TARGET IOP IN GLAUCOMA

A. Reda1, H. Elhamzawy2, M. Khalf1, M. Samy2, A. El Maghraby2

1 Dar El Oyoun Eye Center, Oman, 2 Magrabi Eye Hospital, Cairo, 3 Ain Shams University, Egypt

Purpose: To determine the target IOP for each individual patient with POAG which does not differ from one ophthalmologist to another.

Design: Prospective observation case series.

Participants: Two hundred and twenty eyes of newly diagnosed POAG.

Methods: A very comprehensive scoring system is designed that takes into consideration various risk factors which may lead to the development and progression of glaucoma. The score includes IOP, optic disc cupping, visual field loss, central corneal thickness, positive family history, and presence of pseudoxefoflation or pigment dispersion. Age, race and myopia were also included.

Main Outcome Results: No significant changes of visual fields or optic discs during the follow-up period (12 months), while maintaining the individual calculated target IOP.

LONG-TERM VARIABILITY OF INTRAOCULAR PRESSURE AND PROGRESSION OF OPEN-ANGLE GLAUCOMA

C. Rössler, A. Junemann, N. Bellios, R. Lämmer, C. Mardin, F. Horn

Department of Ophthalmology, University of Erlangen-Nürnberg, Erlangen, Germany

Purpose: To evaluate whether the long-term variability of office intraocular pressure (IOP) measurements influences the rate of progression of chronic open-angle glaucoma. Patients and methods: 668 patients of the Erlangen Glaucoma Registry with a follow-up of 6.1 ± 4 years were included in this study: 95 normal controls (N, 50.3 ± 9.4 years, 108 female, 85 male), 233 patients with ocular hypertension (OHT, 49.6 ± 8.7 years, 107 female, 109 male), 159 patients with preperimetric open-angle glaucoma (prePOAG, 49.0 ± 11.6 years, 85 female, 112 male), and 181 patients with perimetric primary OAG (pOAG, 53.7 ± 11.6 years, 131 female, 105 male). Morphological progression was found in 15/233 OHT, 59/159 prePOAG, and 76/181 pOAG. The IOP obtained by Goldmann applanation was taken yearly during the office examination at 0900. Non-parametric testing was performed.

Results: The long-term variability of IOP was significant higher in all patient groups in comparison to normals (N: 3.8 ± 2.2 mmHg, OHT: 6.7 ± 4.1, prePOAG: 7.2 ± 4.3, OAG: 7.1 ± 4.5, p < 0.001). In all patient groups, patients with progression revealed significantly higher long-term variability of IOP (OHT: 6.4 ± 3.7 vs. 10.3 ± 6.6, p = 0.006, prePOAG: 6.6 ± 4.0 vs. 8.2 ± 4.7, p = 0.029 OAG: 6.4 ± 4.6 vs. 8.2 ± 4.1, p < 0.001). Mean IOP and maximal IOP showed no significant difference between patients with progression and stable patients in all study groups.

Conclusion: This study suggest that the risk for progression in patients with ocular hypertension, early (preperimetric) and perimetric glaucoma is associated with long-term variability (range) of office IOP measurements.

Submitted to the 2008 ARVO meeting.
Purpose: To measure retinal oxygen saturation and ocular blood flow in patients participating in a clinical trial in which the ocular circulation effect of cosopt and timolol were compared.

Methods: Twenty eyes of twenty primary open-angle glaucoma (POAG) patients were included in this double-masked, randomized, crossover study. Mean age [range] was 48 y ± 10.4 [26 to 70]. Mean IOP was 20.3 mmHg, md ± 0.8 ± 2.3 dB, disc-area = 2.05 ± 0.26 and rim-area = 1.15 ± 0.26. The visual field testing was performed with the Humphrey Field analyzer. Scanning laser Doppler flowmetry was used to measure ocular blood flow. The determination of oxygen saturation was performed using the imaging spectrometer. Different extinction spectra of hemoglobin and oxyhemoglobin created the basis for the non-invasive estimation of the oxygen saturation. The measurements of the reflectance spectra were performed waveband from 400 nm to 700 nm. The retinal oxygen saturation was measured with an entrance slit of 1.5 mm, spectral resolution of ** < 2m, and local resolution *s < 20*m. The time course of study was: 14 days washout - baseline measurement - 10 days medication with first drug - 14 days washout - 10 days medication with second drug.

Results: The mean pre-treatment IOP was 20.3 ± 4.5 mmHg. After 10 days of treatment with timolol the mean IOP decreased to 15.07 ± 3.49mmHg. After 10 days of treatment with cosopt the mean IOP decreased to 13.66 ± 2.89 mmHg. The mean retinal capillary perfusion showed no significant difference under treatment with cosopt (p = 0.32) and timolol (p = 0.52). The oxygen saturation in veins was significant higher under treatment with cosopt (p = 0.006). No significant differences in retinal oxygen saturation was found under treatment with timolol in comparison to baseline.

Conclusions: These results suggested that cosopt increases the oxygen saturation in veins for the purpose of optimization of arteriovenous oxygen delivery.

Purpose: It is generally assumed that the venous pressure in the eye equals the intraocular pressure. This assumption seems to be not correct for the prelaminar part of the optic nerve head in every single case. The reasons are as follows: According to Hayreh the blood in this tissue comes from the short ciliary arteries and leaves it by the central retinal vein. We know from the papers of R. Meyer-Schwickerath and of Morgan expands our view on ocular blood circulation to the venous side. The potential of arteriolar dilation may have a protective effect. The new understanding of the pulsation phenomenon of the central retinal vein given by R. Meyer-Schwickerath and by Morgan expands our view on ocular circulation to the venous side.

Discussion: In about half the glaucoma eyes the pressure in the central retinal vein is higher than the intraocular pressure. These are eyes in which a decrease of the intraocular pressure does not improve the perfusion pressure in the prelaminar part of the optic nerve head. According to the presently widely acknowledged circulation theory of the glaucoma damage a merely pressure lowering therapy may have no protective effect to the optic nerve fibers in these eyes. Carboxyhydrate inhibitors only the potential of arteriolar dilation may have a protective effect. The new understanding of the pulsation phenomenon of the central retinal vein given by R. Meyer-Schwickerath and by Morgan expands our view on ocular circulation to the venous side.

These results are submitted as an abstract to ARVO 2008.
P119

COMPARISON OF THE COMFORT OF BID DOSED AZARGA® TO BID DOSED COSOPT® IN PATIENTS WITH OPEN-ANGLE GLAUCOMA OR OCULAR HYPERTENSION

S. Vold1, R. Evans2, R. Stewart3, T. Walters4, S. Mallick5
1 Boozman-Hof Regional Eye Clinic, Rogers, Arkansas, 2 Medical Center Ophthalmology Associates, San Antonio, TX, 3 Houston Eye Associates, Houston, TX, 4 Texan Eye Care, P.A., Austin, TX, 5 Alcon Research, Inc., Fort Worth, TX, USA

Purpose: To evaluate the ocular discomfort of Brinzolamide 1%/Timolol 0.5% ophthalmic suspension (Azarga®) dosed twice daily compared to Cosopt® dosed twice daily following multiple dosing in patients with open-angle glaucoma or ocular hypertension.

Methods: Adult OAG or OHT patients on a single IOP-lowering medication, who met the inclusion/exclusion criteria and provided written informed consent at the Screening Visit, assessed the comfort of their current medication on a five unit ocular discomfort scale ranging from 0 (none) to 4 (very severe). Patients were randomized to receive either Brinzolamide 1%/timolol 0.5% fixed combination (n = 48) or Cosopt® (n = 48) and were instructed to dose twice daily for one week. Patients assessed the ocular discomfort of their assigned study medication at the Week 1 Visit; the primary endpoint was mean ocular discomfort score. Safety was assessed via ophthalmic parameters and adverse events.

Results: Mean ocular discomfort score at Week 1 was significantly greater (p = 0.0003) for the Cosopt® group (1.53) compared to the Brinz/Tim group (0.77). The mean increase from baseline in ocular discomfort for the Brinz/Tim group (0.49) was significantly less than that observed for the Cosopt® treatment group (1.32). A significantly higher percentage of patients in the Brinz/Tim group (49%) experienced no ocular discomfort after 1 week of dosing (p = 0.0004) compared to patients who received Cosopt® (15%).

Conclusion: The ocular comfort of BID-dosed Brinzolamide 1%/Timolol 0.5% Ophthalmic Suspension is superior to that of BID-dosed Cosopt®. Patients experiencing ocular discomfort with their ocular hypertensive medications may be prone to being non-adherent to their dosing regimen.

P120

TREATMENT OF GLAUCOMA PATIENTS WITH INADEQUATE INTRAOCULAR PRESSURE CONTROL: A SURVEY OF GERMAN OPHTHALMOLOGISTS IN PRIVATE PRACTICE

C. Vorwerk1, U. Thelen2, F. Kimmich3, R. Buchholz4
1 Department of Ophthalmology, Otto-von-Guericke-University, Magdeburg, Germany, 2 Private Practice, Münster, Germany, 3 eyecons, Pfinztal, Germany, 4 Allergan Europe, Ettlingen, Germany

Purpose: To determine if recent findings regarding diagnosis, therapy, and follow-up of patients with ocular hypertension (OH), primary open-angle glaucoma (POAG), and other types of glaucoma are established in day-to-day practice in Germany.

Methods: Ophthalmologists in Germany were surveyed using a standardized questionnaire. Data from 335 ophthalmologists and 853 patients with difficulty to treat glaucoma or OH were collected. This information included diagnosis, therapy, disease severity, target intraocular pressure (IOP), and actual IOP.

Results: Mean target IOP for all patients was 16.6 ± 2.3 mmHg, whereas mean actual (treated) IOP was 20.3 ± 4.3 mmHg. Actual IOP values followed a normal distribution with a 20 mmHg maximum. Disease severity influenced the choice of target IOP: mean target IOP for patients with OH (n = 110) was 18.5 ± 2.0 mmHg whereas mean target IOP for patients with glaucomatous optic nerve head damage and visual field defects (n = 437) was 16.4 ± 2.4 mmHg. The most frequently chosen target IOP value was 18 mmHg (358 eyes).

Conclusions: The target IOP concept is widely established in day-to-day glaucoma management, and disease severity influences the determination of target IOP. Our results suggest that a combination therapy could help this difficult to treat population achieve the target IOP.
and from baseline to 24 weeks (F = 439.3, p < 0.0001; F = 305.94, p < 0.0001). There were no differences in treatment effect between the three drugs or between the two ethnic groups, (p > 0.05 for all comparisons) and there was no interaction between race and drug.

Conclusion: All three of the three prostaglandin-amine drugs are highly effective at lowering intraocular pressure. There were no differences in effect between the drugs, and no differences in response between members of different racial groups.

P122

IN VITRO EFFECTS OF PRESERVATIVE-FREE TAFLUPROST, AND PRESERVED LATANOPROST, TRAVOPROST, AND BIMATOPROST IN A CONJUNCTIVAL EPITHELIAL CELL LINE

E. Brasnu1, F. Brignole-Baudouin2, L. Riancho2, H. Liang1, J. Guenoun1, J. Warner1, C. Baudouin1
1 Dpt of Ophthalmology III, Quinze-Vingts National Ophthalmology Hospital, Paris; 2 Dpt of Toxicology, Faculty of Biological and Pharmacological Sciences, Paris Descartes University, France

Purpose: Most of the commercially available formulations of prostaglandin (PG) F2α analogues used for the treatment of glaucoma contain the preservative benzalkonium chloride (BAK), which has shown dose-dependent pro-inflammatory, pro-necrotic, pro-apoptotic, and pro-oxidative effects on conjunctiva in vivo and in vitro. Our purpose was to compare the toxicity profiles of three commercially available PG analogues — latanoprost, travoprost, and bimatoprost — with that of preservative-free tafluprost, a new PG analogue, on human conjunctival cells in vitro.

Methods: Cells from the IOBA-NHC immortalized epithelial cell line from normal human conjunctiva were exposed for 30 minutes to 1/10 dilutions of BAK-containing commercially available solutions of latanoprost, travoprost and bimatoprost, and preservative-free tafluprost. Membrane integrity/cellular viability, apoptosis, and oxidative stress were assessed using microplate cytofluorometry and flow cytometry. Standard immunofluorescence was performed to study the morphological patterns of cells under the same conditions.

Results: Of the solutions studied, preservative-free tafluprost resulted in significantly higher membrane-integrity, low oxidative stress, and low pro-apoptotic effects. Immunofluorescence showed that cell shrinkage increased in a BAK-concentration dependent manner, with low shrinkage being observed with preservative-free tafluprost.

Conclusions: These results suggest that the preservative-free formulation of tafluprost, a new prostaglandin analogue, has low pro-apoptotic, pro-necrotic, and pro-oxidative effects on conjunctival cells in vitro.

P124

FOR WHICH GLAUCOMA SUSPECTS IS IT APPROPRIATE TO INITIATE TREATMENT?

J. Giaconi1, E. Cheng2, B. Lee3, S. Newberry4, M. Suttorp5, A. Coleman6
1 UCLA & VA Greater Los Angeles, 2 RAND, UCLA, & VA Greater Los Angeles, 3 Kaiser Permanente Southern California, 4 RAND, 5 UCLA, USA

Purpose: Although treatment reduces the risk that a glaucoma suspect will develop glaucoma within five years, there remains uncertainty on which glaucoma suspects to initiate treatment.

Methods: We followed the RAND/UCLA appropriateness method, a well-established protocol to determine the appropriateness of treatment. Based on a structured review of the literature, we identified variables potentially relevant to glaucoma treatment decisions and created scenarios consisting of permutations of these variables. We then convened an international eleven-member panel composed of recognized leaders in the field of glaucoma. The panel revised the variables and scenarios, then formally rated the appropriateness of initiating treatment for the glaucoma suspects depicted in the scenarios on a risk-benefit scale through a two-round modified Delphi method. Statistical analyses were conducted to identify rules that could best identify glaucoma suspects with panel ratings of appropriateness.

Results: The panel chose age, life expectancy, intraocular pressure, central corneal thickness, cup/disc ratio, disc size, and family history as the key variables to consider when deciding to initiate treatment on a glaucoma suspect. Permutations of these variables created 1800 unique scenarios of glaucoma suspects. The panel ratings for 33% of the scenarios met criteria for appropriateness, the panel ratings for another 35% met criteria for inappropriateness, and the remaining 32% of scenarios were considered indeterminate (benefits and risks considered either equal or uncertain). ANOVA determined that intraocular pressure had as much impact on panel ratings as all other variables combined. Recursive partitioning determined that a simple
rule for identifying panel ratings of appropriateness was IOP > 26 mmHg and < 90% 5-year risk of mortality (life expectancy not short); this rule had a sensitivity and specificity of 63% and 92%. We also created a point system for identifying panel ratings of appropriateness; this system had greater sensitivity and specificity of 96% and 93%, but required more calculations on the part of the clinician.

Conclusions: We identified glaucoma suspects for which there was agreement on whether to initiate treatment and developed classification systems for clinicians to identify such patients. For scenarios of glaucoma suspects in which there was uncertainty to treat, more evidence from the literature is required to reach consensus.

P125
CORRELATION BETWEEN TRAVALERT’S PATIENTS ADHERENCE TO GLAUCOMA THERAPY AND VISUAL FIELD LOSS PROGRESSION
P. Frezzotti, M. Figus, G. Martone, S. Peruzzi, V. Mittica, D. Galli, M. Bartolomei, E. Motolese
1 Department Ophthalmology, University of Siena,
2 Department Ophthalmology, University of Pisa, Italy

Purpose: The aim of the study was to evaluate the persistence and the adherence of therapy using Travalert® device and to correlate patients adherence with visual field loss progression.

Methods: This study had an open-label, multicenter, prospective design that included 90 primary open-angle glaucoma patients already on travoprost (Travatan™) or travoprost/timolol fixed combination (DuoTrav™, Alcon, Inc., Fort Worth, TX) therapy coming for routine visits in glaucoma service. Subjects were given a device, the Travalert®, recording date, time and number of drop instillation. The study consisted of 4 visits: screening, week 4, months 6 and 12. Patients were instructed to use Travalert at the screening visit and the quality of employment was evaluated at 4 week, 6 and 12 months visits. To evaluate the visual field loss progression the Brusini Glaucoma Staging System (GSS) 2 was used. To correlate the patients adherence with visual field progression patients were divided in two groups according their medication adherence reported by Travalert: greater (group A) or lower (group B) than 75%. At the final visit patients were administered a questionnaire to rate usefulness of Travalert.

Results: 75 patients were enrolled and 65 of them completed the study (7 patients returned the device, 3 broke it) and were included in the analysis. Mean patient’s age was 67.1. All Subjects reported no problem in using the device. In The group A there were 45 patients and the adherence’ mean score was 86.7, while in the group B there were 20 patients and the adherence’ mean score was 38.8 (p < 0.05). There were no significant statistical difference in age and medical therapies between two groups (p > 0.05). The GSS mean score of the group A was improved in 19.2%, unchanged in 42.4% and worsened in 38.4% of patients, for the group B was improved in 15%, unchanged in 55% and worsened in 30% of patients (p > 0.05). No correlation was found between the quality of adherence of therapy and the visual field loss progression.

Conclusion: Since non compliance with hypotensive treatment is common among glaucoma patients, Travalert® offers a convenient method to monitor the patients and our study demonstrate that patients appreciate the device. However, there is no strong evidence supporting a relation between non compliance and progression of visual field loss.

P126
ADJUNCTIVE IOP-REDUCING EFFECT OF TRAVPROST IN PATIENTS INSUFFICIENTLY CONTROLLED ON TIMOLOL-DORZOLAMIDE FIXED COMBINATION
M. Guzey, A. Satici
Harran University School of Medicine Department of Ophthalmology Sanliurfa, Turkey

Purpose: To study the additive effect of travoprost in patients who have uncontrolled intraocular pressure (IOP) using timolol-dorzolamide fixed combination.

Methods: 41 consecutive patients with primary open-angle glaucoma who were using timolol-dorzolamide fixed combination were considered to have IOP above their defined target pressure were included in this study. The additive effect of travoprost on IOP was followed during 6 months period. The criterion for success was defined as having an IOP reduction of at least 15% from baseline or a final IOP of less than 21 mmHg.

Results: Mean baseline IOP was 24.1 ± 2.2 mmHg. 3 patients were discontinued from treatment because of side effects. In 70 eyes of 38 patients, IOP was significantly reduced compared with baseline measurements with a mean IOP reduction of 5.9 ± 1.7 mmHg, 5.6 ± 1.9 mmHg, 5.1 ± 2.2 mmHg at the 1, 2 and 6-month follow up controls respectively (p < 0.001). Successful outcome was obtained in 58 (82.9%), 52 (74.3%) and 47 (67.1%) eyes at 1, 2 and 6-month visits respectively.

Conclusion: Travoprost had an additive effect when used as a third drug for patients on timolol and dorzolamide who were in need of further IOP reduction. This study supports the use of travoprost additive therapy in patients with elevated IOP already receiving timolol-dorzolamide fixed combination therapy.

P127
EFFICACY AND SAFETY OF A FIXED COMBINATION OF BIMATOPROST AND TIMOLOL (GANFORT®) IN THE TREATMENT OF PATIENTS WITH POAG OR OCULAR HYPERTENSION, A 3-MONTH STUDY
C. Hartlieben, M.A. Beltran, H. Casab1, A. García-lópez, F. Gil, J. Jiménez-román, V. Korder, J.A. Paczka, M. Moreno, G. Velasco
1 Instituto de Oftalmología México, 2 COS Hermosillo Son, 3 Hospital La Luz México, 4 APEC México, 5 Diagnóstico Temprano de Glaucoma, Jal, 1 ISSTE Veracruz, 2 Clínica Oft. Hidalgo, Monterrey, Mexico

Purpose: To study the efficacy and safety of a fixed-combination of bimatoprost and timolol (Ganfort®) one drop in the morning for treatment of POAG or ocular hypertension in a 3 month multicenter study in Mexico.

Method: The design was prospective, multicenter, open-label, clinical phase IV, ongoing study of 116 patients who were naive to treatment or after washout, were given Ganfort drops at wakening. Measurements were taken at trough (8 am) and peak (10 am) at baseline, at 1 week, and at month 1, 2 and 3. IOP was the main variable, and VFs were taken at slit lamp for adverse effects and interrogation for side effects. Statistical analysis was done by Anova, Wilcoxon and Bonferroni’s post-hoc test.

Results: 116 patients were included, and followed up for 3 months, of which 112 patients finished the study. 3 patients were withdrawn from the study because of allergy (2) or systemic side effects (1, low blood pressure and bradycardia), and one abandoned treatment. Mean IOP at
baseline (after washout of up to 4 weeks) started as a mean of 21.58 mmHg and ended at the 3 month end of study, at 15.34 mmHg at peak hour (10 am), a drop of 6.24 mmHg or 28.91% (range: 8.5-20 mmHg). As for response rate, 85% of patients had a 20% IOP drop or more. The subgroup of 54 patients who had originally been on beta-blockers had a larger IOP drop (6.34 mmHg) vs. the ones who had been originally on prostaglandins (5.56 mmHg). Adverse events were 3%: Side effects were local in 2 cases, which necessitated termination of study, one severe allergy and one intense conjunctival hyperemia and lid swelling. One case had low blood pressure and bradycardia, and was also removed from study. When asked about patient satisfaction, 90% of patients responded they were satisfied with treatment.

Conclusion: Once-daily treatment with Ganfort™ was effective in lowering IOP 28.9% or 6.24 mmHg in patients with POAG or ocular hypertension in this 3 month study. We found a 3% of adverse effects that necessitated removal of patients from study protocol.

P128

EFFICACY AND SAFETY OF A FIXED-COMBINATION OF BRIMONIDINE AND TIMOLOL (COMBIGAN®) IN THE TREATMENT OF PATIENTS WITH POAG OR OCULAR HYPERTENSION, A 6 MONTH STUDY

F. Gil1, C. Hartlieben2, M.A. Beltrán4, H. Casab3, A. García-López4, J. Jiménez-Román2, V. Korder7, M. Moreno8, J.A. Paczka9, G. Velasco10

1 APEC, México, 2 CONVAL México, 3 Hermosillo México, 4 CONVAL México, 5 CONVAL México, 6 APEC México, 7 Conval México, 8 ISSSTE Veracruz, 9 U. Diagnóstico Temprano Glaucoma, Jalisco, 10 Clínica Oft. Hidalgo, Monterrey, Mexico

Purpose: To study the safety and efficacy of a fixed combination of Brimonidine 2% and Timolol 0.5% (Combigan®) in the treatment or patients with POAG or ocular hypertension, who were previously untreated with prosta glandin analogs or other fixed combinations.

Method: The design was prospective, open-label, clinical phase IV. 164 patients with previously uncontrolled POAG or OH were substituted with Combigan® b.i.d. without a washout period, and IOPs were measured at trough (8 am) and peak effects (10 am). Measurements were taken at baseline, 1 week, and monthly for 6 months. IOP was the main variable, although VFs were taken at baseline, 3 and 6 months. Safety was evaluated at slitlamp for adverse effects, as well as interrogation for side effects. A small cohort (75 patients) was followed up for observation of safety and efficacy up to 18 months. Statistical analysis was done by ANOVA, Wilcoxon and Bonferroni's post-hoc test.

Results: 164 patients were recruited, and followed up. 71% of patients were previously under prostaglandin analogs or other fixed combinations. 42 patients were previously under prostaglandins, 54 from beta-blockers and 68 from other fixed combinations.

Adverse events were 3%: Side effects were local in 2 cases, which necessitated termination of study, one severe allergy and one intense conjunctival hyperemia and lid swelling. One case had low blood pressure and bradycardia, and was also removed from study. When asked about patient satisfaction, 90% of patients responded they were satisfied with treatment.

Conclusion: Once-daily treatment with Ganfort™ was effective in lowering IOP 28.9% or 6.24 mmHg in patients with POAG or ocular hypertension in this 3 month study. We found a 3% of adverse effects that necessitated removal of patients from study protocol.

P129

ELECTRONIC COMPLIANCE MONITORING IN GLAUCOMA PATIENTS USED TO TOPICAL THERAPY

M. Hermann1, A. Bron2, M. Dietelholst1

1 Department of Ophthalmology, University Hospital, Cologne, Germany, 2 Department of Ophthalmology, University Hospital, Dijon, France

Purpose: Retrospective cohort studies suggest the rate of non-compliance in glaucoma to be of major importance since non-compliance may lead to blindness. Monitoring individual compliance may improve the understanding of therapy failure and the reasons why certain patients fail with their therapy. Individual compliance of glaucoma and ocular hypertensive patients with Brimonidine was studied with regards to total dose, dosage intervals, coverage, drug waste, attempts per application and risk factors for low compliance.

Methods: Thirty-eight men and twenty-six women aged 70 ± 11 years [42-89] received conventional Brimonidine vials (Alphagan®, Allergan™) equipped with a microprocessor-controlled monitoring device capable to record date and time of each eye drop application with a known detection sensitivity for eye drop applications – 99%. After written informed consent 48 glaucoma and 16 ocular hypertensive patients used to eye drop therapy for 11 ± 8 years [1-35] were enrolled and randomly assigned to Brimonidine therapy b.i.d or t.i.d daily for 4 weeks. IOP was measured at baseline and after one month.

Results: Electronic records revealed a mean of 1.4 applications per day (range: 0.7-2.2) for patients assigned to Brimonidine 2x daily with a mean treatment interval of 18.2 hours (range: 11.2-38.4 h). Patients on Brimonidine 3x daily showed a mean rate of 1.8 applications per day (range: 1.0-2.7) and a mean treatment interval of 12.4 h (range: 9.1-39.7 h). 10 patients ceased therapy before completing the 4 weeks period, wherein 4 with side effects and 6 patients having emptied the bottle prematurely.

Conclusion: Individual compliance with conventional Brimonidine eye drops was studied by means of a recently developed compliance monitoring device. The monitoring devices revealed a high variability of individual results with regard to missed doses and non-treatment intervals. Almost 10 percent of the patients emptied their vial in less than 4 weeks by using more than one drop per application and thereby do need refills more often than usually calculated. Our data confirm the need for larger studies on individual compliance with topical ocular therapy in glaucoma. Electronic compliance monitoring may be a useful tool in ophtalmic practice to recognize low-compliant patients. Whether compliance can be sufficiently modified to optimize glaucoma therapy remains to be studied.

Acknowledgements: Data also presented at ARVO Meeting 2008.

P130

AGONISTIC AUTOANTIBODIES AGAINST BETA2-ADRENERGIC RECEPTORS IN OCULAR HYPERTENSION AND PRIMARY OPEN-ANGLE GLAUCOMA

A. Jüenemann1, M. Herrmann2, A. Sheriff5, P. Stergiopoulos1, U. Schlötzer-Schrehardt1, F. Kruse1, R. Kunze3, G. Wallukat4

1 Department of Ophthalmology, Friedrich-Alexander-University, Erlangen-Nuremberg, 2 Institute for Immunology, Friedrich-Alexander-University, Erlangen-Nuremberg, 3 Fresenius Medical Care, Bad Homburg, 4 Max-Delbrück-Center for Molecular Medicine Berlin-Buch, Germany

Purpose: Betablockers are a standard therapy in POAG. Therefore, the purpose of this study was to analyze whether
autoantibodies (AAB) against beta2-adrenergic receptors can be detected in patients with ocular hypertension and primary open-angle glaucoma.

Methods: 48 patients with primary open-angle glaucoma (POAG), 11 patients with ocular hypertension (OHT), and 19 controls were included. The autoantibodies (AAB) are diagnosed in a bioassay. Cultured neonatal rat cardiomyocytes are used to identify AAB directed against G-protein coupled receptors (GPCR) and to study their interaction. These cells beat spontaneously and express several GPCR. The change in the activation status of the cells can be measured directly by counting the beating rate. The specificity of the observed effects and the identification of the involved receptor type are tested by the administration of receptor specific antagonists. The "bioassay" for agonistic antibodies, stimulating rat cardiomyocytes is highly reproducible.

Results: Antibodies stimulating rat cardiomyocytes via the beta2-adrenergic receptor can be found in 75% of Primary Open Angle Glaucoma (POAG) and 73% OHT patients. The effect was highly significant in both groups (p < 0.001). Stimulation of rat cardiomyocytes by AAB in POAG and OHT is sensitive for ICI, a specific beta2-adrenergic receptor blocker which actively decreases contraction through a G-protein coupled form of the beta2-adrenergic receptor. Cardiomyocytes are sensitive against the beta2-agonistic clenbuterol in the presence of negative sera. Clenbuterol belongs to Therefore, the cardiomyocytes, which were incubated with the negative samples, worked properly. Additionally, we resolved that AAB of POAG patients stimulating rat cardiomyocytes are of IgG3 isotype.

Conclusions: In patients with POAG and OHT agonistic autoantibodies directed to G-protein coupled beta2-receptor were found. The findings may indicate a possible role in the aqueous humor dynamics and may support autoimmune aspects of the pathogenesis of open-angle glaucoma.

**P131**

**ONE YEAR LONG-TERM COMPARISON OF BRINZOLAMIDE/TIMOLOL VS. DORZOLAMIDE /TIMOLOL IN PATIENTS WITH OPEN-ANGLE GLAUCOMA OR OCULAR HYPERTENSION**

G. Manni1, P. Denis2, T. Zeyen3, T. Aung4, I. Januleviciene5, B. Fristrom6, Y. Patwala7, P. Kestelyn8, I. Filatori9, J. James10

1 University of Rome Tor Vergata, Italy, 2 Ophthalmology Department Hospital Edouard Herriot, Lyon Cedex, France, 3 Ophthalmology Department University St. Rafaël, Leuven, Belgium, 4 Singapore National Eye Centre, Singapore, 5 Eye Clinic of Kaunas University of Medicine, Kaunas, Lithuania, 6 Eye Clinic University Hospital, Linköping, Sweden, 7 Arrow Park Hospital, Wirral, United Kingdom, 8 Eye Clinic University Hospital, Ghent, Belgium, 9 Alcon Italia S.p.a., Milan, Italy, 10 Alcon Research, Ltd., Fort Worth, TX, USA

Purpose: This study compared the intraocular pressure (IOP)-lowering efficacy of two fixed combinations, Brinzolamide 1%/Timolol 0.5% Eye Drops, Suspension (AZARGATM, Brinz/Tim) and Dorzolamide 2%/Timolol 0.5% Eye Drops, Solution (COSOPT®®, Dorz/Tim), in patients with open-angle glaucoma or ocular hypertension who required additional therapy.

Methods: One-year, multi-center, randomized, double-masked, active controlled, parallel group comparison of Brinz/Tim and Dorz/Tim. The pre-treatment phase of the study consisted of a screening, wash-out, and two Eligibility visits. The treatment phase included visits at Week 2, Months 3, 6, 9 & 12. IOP assessments were taken at 8 & 10 AM at Week 2 & Months 3 & 9; and at 8 AM, 10 AM & 4 PM at Months 6 & 12. Primary efficacy was prospectively planned as a non-inferiority comparison of mean IOP at the three Month 6 time-points. Months 9 and 12 were primarily for safety.

Results: Of the 437 patients enrolled, 220 received Brinz/Tim and 217 Dorz/Tim twice daily. Brinz/Tim produced IOP-lowering efficacy comparable to Dorz/Tim, with the upper 95% confidence limits for the differences between groups within +1.5 mmHg at all assessment times, including the Month 6 primary efficacy time points, establishing non-inferiority. Differences in means numerically favored Brinz/Tim at 9 of 12 study visits and times. Mean IOP reductions from baseline for Brinz/Tim were clinically relevant and statistically significant at all measurement times. The IOP reductions ranged from 7.2 to 9.2 mmHg for Brinz/Tim and from 7.4 to 8.9 mmHg for Dorz/Tim. Up to 60% of patients in the Brinz/Tim group and up to 59% of patients in the Dorz/Tim group had IOP < 18 mmHg. Following dosing of Brinz/Tim, mean IOP ranged from 16.7 to 18.8 mmHg; following dosing of Dorz/Tim mean IOP ranged from 16.9 to 19.4 mmHg. While a similar overall safety profile was observed between the two treatment groups, Brinz/Tim showed a local comfort advantage over Dorz/Tim in terms of ocular irritation (2.7% vs. 10.6%) and ocular pain (2.7% vs. 6.5%).

Conclusions: Brinzolamide 1%/Timolol 0.5% Eye Drops, Suspension provides statistically significant and clinically relevant IOP-lowering efficacy that is non inferior to Dorz/Tim. Additionally, Brinz/Tim affords an ocular comfort advantage over Dorz/Tim.

**P132**

**THE HYPTENITIVE EFFECT OF ANTERIOR JUXTASCLERAL DEPOT OF ANECORTAVE ACETATE IN DIFFERENT TYPES OF GLAUCOMA**

I.M. Tavares, T.S. Prata, P.A. Mello, C. Tamura, R. Belfort Jr. Vision Institute, Federal University of Sao Paulo, Brazil

Purpose: To evaluate the efficacy and safety of anecortave acetate (AA) anterior juxtascleral depot (AJD) injection to reduce intraocular pressure (IOP) in glaucoma patients.

Methods: A prospective, non-randomized, open-labeled clinical trial in 28 eyes of 28 uncontrolled glaucoma patients. All received a single AJD of AA (24-30 mg) in one selected eye under topical anesthesia. Baseline and post-injection assessments were scheduled at week 1, month 1, month 2, and month 3.

Results: Mean age of patients was 58.2 (± 18.6) years. The primary diagnoses were primary open angle glaucoma (8/28; 28.6%) and uveitic / steroid induced glaucoma (10/28; 35.7%). As for gonioscopy, 42.8% had open angle, 10.8% < 90° of angle closure, and 46.4% > 90° of angle closure. Mean IOP at baseline was 30.7 (± 9.3) mmHg and 57.1% of the patients had prior intraocular surgery. Mean IOP at months 1, 2, and 3 were 19.8 (± 6.3) mmHg, 20.9 (± 7.3) mmHg and 21.7 (± 6.8) mmHg, respectively. Mean IOP reduction at months 1, 2, and 3 were 33.6%, 30.1% and 27.2% respectively. At month 3, angle closure glaucoma eyes had a mean IOP of 22.5 mmHg (reduction of 34.6%) while open angle glaucoma eyes had a mean IOP of 20.8 mmHg (reduction of 16.7%). A mild subconjunctival hemorrhage was observed in four cases and one eye developed a small and transient corneal dehiscence.

Conclusions: A single administration of Anecortave Acetate by AJD demonstrates a significant IOP reduction for at least three months (p = 0.0001) with no clinically apparent serious
adverse events in eyes with different types of glaucoma with open and also closed angle.

P133

A COMPARISON OF THE EFFICACY AND SAFETY OF THE BIMATOPROST/TIMOLOL VERSUS LATANOPROST/TIMOLOL FIXED COMBINATIONS IN OPEN-ANGLE GLAUCOMA PATIENTS

A. Martinez, M. Sanchez
Instituto Galleo de Oftalmología, Spain

Purpose: To assess the efficacy and safety of bimatoprost/timolol fixed combination (BTFC) versus latanoprost/timolol fixed combination (LTFC) given each evening over the 12-hour intraocular pressure (IOP) diurnal curve.

Methods: We designed a prospective, randomized, evaluator-masked, single center, crossover study. Our study included 54 eyes of 54 patients with open-angle glaucoma (OAG). Patients with an IOP of equal or higher than 19 mmHg, under treatment with prostaglandin analogues, were randomized to BTFC or LTFC for a 12-week treatment period after a 6-week run-in period on timolol maleate 0.5% (one drop in each eye twice each day). Patients were then switched to the opposite treatment for the second period. Six 12-hour IOP curves were recorded for each patient at baseline, week-6 and week-12, for each treatment period.

Results: The 12-hour IOP (mean (SD)) values were 22.0 (1.0) mmHg at baseline, 17.7 (0.8) mmHg on BTFC, and 18.5 (0.8) mmHg on LTFC (p < 0.0001). At individual time points there were a significant difference between groups at 8AM, 10 AM, 12 PM, 6 PM, and 8 PM with BTFC having greater ocular hypotensive effect, p < 0.001. The most frequently reported adverse event in the study was conjunctival hyperemia, which occurred in 40.7% (22/54) of patients of the BTFC treatment period and in 35.2% (19/54) of the patients in the LTFC treatment phase (p = 0.6619).

Conclusions: Both fixed combinations significantly reduced the 12-hour IOP from baseline in OAG. Nevertheless, the evening-dosed bimatoprost/timolol fixed combination provides better IOP control than that of latanoprost/timolol over 12 hours.

P134

REPRODUCIBILITY OF RETINAL NERVE FIBER THICKNESS MEASUREMENTS WITH SPECTRAL DOMAIN OCT IN NORMAL AND GLAUCOMATOUS EYES

M. Mete, F. De Feo, G. Bricola, A. Bagnis, M. Iester, C.E. Traverso
Centro di Ricerca Clinica e Laboratorio per il Glaucoma e la Cornea, DI.N.O.G, Università di Genova, Italy

Purpose: Spectral domain OCTs appears to provide improved resolution of RNFL, comparing to time domain OCTs. The RTVue (Optovue, Fremont, CA) is a high-speed high resolution spectral domain OCT that acquires 25,000 A-scans/second with 5-6 micron axial resolution. Purpose of our study is to evaluate the test-retest variability of RNFL thickness measurements in normal and glaucomatous subjects as measured by RTVue.

Methods: 7 healthy subjects and 8 patients affected by primary open angle glaucoma (POAG) underwent RTVue NHM4 scan pattern. That consists of 6 concentric peripapillary scans with diameters from 2 to 4 mm overlaid with 12 radial scans of diameter 3.4 mm. 2 visits within 4 weeks were performed and 3 good quality scans were acquired each time. Standard deviation (SD) and intraclass correlation coefficients (ICC) were calculated for overall average RNFL thickness and quadrant RNFL thickness values.

Results: (Tab. 1) In most cases, ICC was statistically significant (p < 0.05) and it was generally higher in normal than POAG subjects and in intravisit than intervisits variability. That could occur because of a greater difficulty to image pathologic RNFL than normal ones. The higher significativity (p < 0.01) was found in average and superior RNFL thickness. Those values were previously demonstrated to be of particular clinical importance, because significantly correlated with visual field progression in POAG follow-up. The most variable sectors were the temporal and, in a lesser extent, the nasal ones.

Conclusions: RTVue had high ICC for every intervisits and intravisits parameters; in our opinion, the reproducibility of this device could be considered sufficiently good to be useful clinically as a measure of glaucoma progression. However, in literature there are some evidences of devices that, although a less innovative technology, had reached higher reproducibility performances. Analysis algorithms could undertaken some refinements in order to improve RTVue reproducibility.

<table>
<thead>
<tr>
<th>Tab 1</th>
<th>Average</th>
<th>Intravisit Normal</th>
<th>Intervisit Normal</th>
<th>POAG</th>
<th>PD3</th>
<th>ICC</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SD (microns)</td>
<td>4.95</td>
<td>5.23</td>
<td>5.01</td>
<td>5.27</td>
<td>0.81</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td></td>
<td>POAG</td>
<td>POAG</td>
<td>POAG</td>
<td>POAG</td>
<td>POAG</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.06</td>
<td>11.24</td>
<td>10.03</td>
<td>11.24</td>
<td>0.69</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Superior Normal</td>
<td>8.75</td>
<td>9.64</td>
<td>9.01</td>
<td>11.43</td>
<td>0.69</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td></td>
<td>POAG</td>
<td>POAG</td>
<td>POAG</td>
<td>POAG</td>
<td>POAG</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.92</td>
<td>7.72</td>
<td>7.93</td>
<td>7.66</td>
<td>0.02</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12.34</td>
<td>15.01</td>
<td>15.01</td>
<td>15.01</td>
<td>0.66</td>
<td>&lt;0.05</td>
<td></td>
</tr>
</tbody>
</table>

P135

THE EFFECT OF SINGLE DOSE OF CARTEOLOL, BRIMONIDINE AND LATANOPROST ON INTRAOCULAR PRESSURE IN NORMOTENSIVE PEOPLE WITH DIFFERENT AGE GROUPS

D. Oygur Baylanöncek, H. Gungel, I. Basgil, C. Altan, I. Ozdemir, H. Eren
4th Clinic, Beyoğlu Eye Education and Research Hospital, Istanbul, Turkey

Purpose: The aim of this study was to evaluate the difference in single dose effects of topical carteolol, latanoprost and brimonidine tartarate on normotensive people with different age groups.

Method: This prospective, randomized clinical study included 80 eyes of 40 healthy and non-glaucomatous men. They were randomized into two groups: Group I contained the subjects that were younger than 50 years of age, and Group II contained the subjects that were older than 65 years of age. The patients were administered the drops at one week intervals. Measurements were re-taken 12 hours after administration of latanoprost, and 2 hours after the administration of latanoprost and brimonidine tartarate. Inter- and intragroup statistical analyses for the alteration of intraocular pressures (IOP) following the drugs were carried out.

Results: Each drug yielded in a significant reduction in IOP both in Groups I and II (p < 0.001, and p < 0.001). There were a significant difference between the IOP lowering effect of the drugs in Group I (p = 0.05) and in Group II (p = 0.01). Compared to other 2 agents, IOP lowering effect of latanoprost in Group II was striking (p = 0.01). While the IOP lowering effects of carteolol and brimonidine on both groups
were similar, the effect of latanoprost on Group II was signifi-
cantly less than that of on Group I (p = 0.041).
Conclusion: In healthy and normotensive subjects, although the
use of carteolol or latanoprost had similar results in indi-
viduals aged under 50 years, carteolol and brimonidine
seemed to be more effective than latanoprost in reducing IOP
in cases aged 65 years and over; that the effect of la-
tanoprost on this age group was less than the other two.

P136
LONG-TERM FOLLOW-UP OF PERFORATED DIGEL
DRAINAGE DEVICE IN SURGICAL TREATMENT OF
REFRACTORY GLAUCOMA
N. Pashtaev, N.Y. Gorbunova, Y. Batkov
S.N Nydorov Eye Microsurgery Complex, Russia

Purpose: To report long-term data on glaucoma surgery using
original perforated digel drainage device in patients with dif-
ferent types of refractory glaucoma.

Materials and methods: We employed a slightly modified ap-
proach to deep penetrating sclerectomy (DPS) and non-pene-
trating deep sclerectomy (NPDS) on 129 eyes of 120 patients
with implantation of an original drainage device into surgically
created intrascleral lake. In brief, the drainage device is a thin
plastic plate with multiple perforations. It is made of digel, a
polymeric material with hydrophilic and hydrophobic proper-
ties. The primary reason for its implantation is to retard fibro-
sis of the aqueous outflow pathways through preservation of
free fluid circulation. The main outcome measure in the study
was attainment of target intraocular pressure (IOP). Follow-
up ranged from 6 to 42 months.

Results: In the early postoperative period target IOP was
achieved in 115 eyes (89%). At the last follow-up target IOP
without medications was maintained in 106 eyes (82%).
Modern imaging modalities of anterior chamber optical coher-
ence tomography and ultrasound biomicroscopy confirmed
long-term morphological patency of aqueous pathways.

Conclusion: In eyes refractory to standard medical and surgi-
cal treatment the IOP-lowering effect of non-penetrating and
penetrating glaucoma surgery with implantation of digel
drainage device was well maintained after follow-up of up to
42 months.

Financial disclosure: No.

P137
ARE GLAUCOMA PATIENTS REALLY COMPLIANT? ROLE
OF TRAVAILERT DOSING AID
G.C.M. Rossi1, G.M. Pasinetti2, R. Radaelli1
1 UO Oculistica, AO Bolognini, Seriate-Bergamo, University
Eye Clinic, Pavia, 2 UO Oculistica, Istituto Beato Palazzolo,
Bergamo, Italy

Aim: To verify glaucoma patients compliance registered by
Travalert Dosing Aid in relation to age, sex, schooling level,
diagnosis (OH, POAG), visual field defect (Brunisi’s Glaucoma
Staging System, worst eye stage was chosen for analysis),
years from diagnosis, years from therapy, number of systemic
medication.

Patients and methods: Multicenter, observational study at 6
month. 40 subjects with OH or POAG were selected. All pa-
tients were on topical monotherapy (Travatan or Duotrav).
All patients gave their informed consent to the treatment of
recorded data and agreed with the use of Travalert dosing
aid. Patients underwent to a complete ophthalmic examina-
tion at month 1, 3, and 6; all patients answered to generic
questions about therapy adherence and obstacles. Patients
judged pro and contra of Travalert dosing aid. Adherence >
90% was considered very good, between 51 and 89% moder-
ate, and < 50% poor.

Results: Results refer to the first 3 months, 6 months data are
still not available for 8 patients. Definitive data will be
presented at meeting. 3 patients never used the aid: they
didn’t wanted to be controlled by physicians. 7 patients re-
tired from study after month 1 visit, 4 patients after month 3
visit. Compliance was higher at month 1 (very good adher-
ence in 41.4% of patients at month 1, 30% at month 3, and
25% at month 6). There was no difference in compliance by age.
Early GSS defect, women, patients with diagnosis from
> 5 years, and with recently changed therapy (< 1 year)
were more compliant. 60% of OH had very good compliance
versus 47% of POAG. The aid made patients more auton-
omous and more sure of correct drug assumption. Some
patients however preferred to depend from relatives for the
drops assumption or found some difficulties with the aid.

Conclusions: Travalert resulted an useful tool both for the pa-
tient and for the ophthalmologist. The ophthalmologist can
record the real compliance; the patient is more sure of the
therapy and is facilitated in the instillation. The aid is general-
ly well accepted but there is an high discontinuation in its use
along a follow-up period of 6 months. Travalert dosing aid is
particularly indicated in older and alone patients.

P138
DYNAMIC OCT ANGLE ASSESSMENT (DOCTAA) TO
PREDICT ANGLE CLOSURE
R. Scotto, D. Venzano, A. Zambelli, M. Mete, C.E. Traverso
Centro Di Ricerca Clinica E Laboratorio Per Il Glaucoma E La
Cornea, D.I.N.O.G., Università di Genova, Italy

Purpose: the most common mechanism causing angle closure
glaucoma (ACG) is relative pupillary block: that can be treat-
ed or prevented by a yag-laser peripheral iridotomy (YLPI).

The anatomic configuration called plateau iris, in which the
peripheral iris may occlude the trabecular meshwork, can also
cause ACG. Gonioscopy is considered the gold standard for
the evaluation of the angle. Anterior segment OCT provides
a rapid noncontact method for the assessment of the angle.
Purpose of our study is to analyze the capability of DOCTAA
to assess the risk of ACG and clarify the underlying mecha-
nism, in order to suggest the proper therapeutical approach.

Methods: Cross-sectional observational study. 32 patients
were included and divided in three groups: angle width ≥ 25°
group 1), angle width < 25° (group 2) and previous ACG in
the fellow eye (group 3). Patients underwent anterior seg-
ment OCT (RT 100-2, Optovue Inc., Freemont, CA, USA) and
angle width was measured in the nasal and temporal quad-
rants. After topical anaesthesia, on group 2 and 3 eyes
peripheral indentation was performed on the inferior sector with
a scleral indenter (Heine, Germany) and angle width was
recorded again. Periferal iris m from the iris root.m.thickness
was also measured at a distance of 750.

results: Average angle width of group 1 was 36.5° ± 5.3°
and 35.7° ± 4.8° in temporal and nasal sectors respectively.

Group 2 showed an angle width of 14.8° ± 2.7° and 13.7° ±
2.8° in temporal and nasal sector, while group 3 of 14.5° ±
and 5.5° and 12.4° ± 1.9°. 75% of group 2 subjects showed an
increasing of 10% of angle width (26.7° ± 8.1° and 20.1° ±
2.7°, namely in the temporal and in the nasal sector), while
in the remaining patients no movements of the iris periphery
was observed (14.8° ± 0.5° and 13.2° ± 2.1° in temporal
and nasal sectors respectively). In group 3 one patient
showed an increasing in angle width (12.7° and 24.9° name-
ly in temporal and nasal sectors), while in the other subject
no variations were recorded (6.8° temporally and 14.4° nasally).

The average m in group 2 mm in group 1, 355 ±
82.3 mperiferal iris thickness was 366.6 ± 39.3 m in group
3, with no significant differences among the groups, and 385
± 86.3 (two-tailed T test, p > 0.05). In most cases, DOCTAA
revealed an opening of the angle. In some subjects of groups 2
and 3, it showed an anterior chamber shallowing with no
movement of peripheral iris. In the former patients YLP1
were demonstrated useful, generating a correct pressure
gradient between anterior and posterior chamber. In the lat-
ter, miotic topic treatment or laser iridoplasty could reduce
the crowding of the angle. In most of those patients, the
lens could impede the recession of the peripheral iris during
corneal indentation: in those cases, phacoemulsification
could be recommended even in the absence of a pupillary
block.

Conclusions: DOCTAA represents a new technique to evaluate
the relationship of angle structures. It seems a useful com-
plement to dynamic gonioscopy in the work-up of patients at
risk of ACG.

P139
AUDIT OF USAGE OF GLAUCOMA EYE DROPS AMONG
PATIENTS ATTENDING THE HOSPITAL EYE CLINIC
K.T. Tharmaseelan, G. Ghosh
Essex County Hospital, Colchester, United Kingdom

Purpose: To find out whether patients are using Glaucoma
medications at the recommended inter dose interval.
Methods: For the purpose of this study we selected dorzo-
lamide2% (Trusopt) and dorzolamide2% and timolol 0.5%
combination (Cosopt) eye drops. 96 Patients were questioned
about the exact times of the day they were using the eye
drops. Each patient was questioned only once during their
follow up visit.
Results: 38 patients were using Trusopt eye drops. Only 8
(13.16%) patients were using the drops at the recommended
regime of 8-10 hour intervals. 58 patients were on Cosopt
eye drops. 30 (51.7%) patients were using this medication at
10-14 hour interval. 60% of all the patients were using the
drops at intervals longer than mentioned above.
Conclusion: Lack of adequate information about the dosage
and timing as well as inconvenience of more frequent applica-
tion were found to be the reasons for noncompliance.

P140
THE CYTOTOXIC EFFECTS OF PRESERVED
PROSTAGLANardin ANALOGUES AND PRESERVATIVE-
FREE TAFLUPROST ON HUMAN CORNEAL EPITHELIAL
AND HUMAN CONJUNCTIVAL EPITHELIAL CELLS IN
VITRO
H.M.T. Uusitalo, A. Huhtala
Department of Ophthalmology, University of Tampere,
Finland

Purpose: To study the possible adverse effects of the oph-
thalmic preparations of prostaglandin analogues, the most
commonly used drug group for glaucoma, using cell culture
methods. The cytotoxic effects of the benzalkonium chloride
(BAC) containing commercial formulations of latanoprost,
travoprost, bimatoprost, and the more recently developed
prostaglandin analogue tafluprost as a BAC-free unit dose for-
mulation, and correspondingly BAC alone were evaluated in
vitro using human corneal epithelial (HCE) and human con-
 jejunctival epithelial (IOBA-NHC) cell cultures.
Methods: The cells were exposed to eye drop concentrations
diluted 10000 times and 10000 times without fetal bovine
serum for one hour. Correspondingly, the cells were exposed
to 0.00008%-0.005% BAC in serum-free medium for one
hour. Cytotoxicity was assessed by measuring mitochondrial
activity with the tetrazolium salt WST-1 assay for cellular
growth and viability, and by measuring the lactate dehydro-
genase (LDH) leakage in the culture medium as the measure-
ment of cell membrane integrity.
Results: The order of decreasing cytotoxicity of the tested
drugs, assessed with the WST-1 test, was latanoprost >
travoprost > bimatoprost > tafluprost. Conjunctival epithelial
cells appeared to be more sensitive than corneal epithelial
cells. The E50 value of BAC, assessed with the WST-1 assay,
was 0.0013% in corneal epithelial cells and 0.00047% in con-
 junctival epithelial cells. In corneal cells, only the commercial
preparation of latanoprost with the highest concentration
tested (10%) increased LDH leakage. In conjunctival cells,
LDH leakage was also very minor and was statistically signifi-
cant only after 3-10% travoprost and 10% latanoprost expo-
sures.

Conclusions: The cytotoxic effects of the commercially avail-
able formulations of latanoprost, travoprost, and bimatoprost
were dependent on the BAC concentration of the eye drop.
Also, the in vitro toxicity of BAC was highly concentration de-
pendent and appeared at the concentrations above those cor-
responding to 0.001% of BAC in ophthalmic medications.
Preservative-free tafluprost had the least cytotoxic effects of
the drugs tested. The results of this study have also been
presented at the ARVO 2008 meeting.

P141
RAREBIT PERIMETRY AND FREQUENCY DOUBLING
TECHNOLOGY: CORRELATION AND CLINICAL
AGREEMENT IN GLAUCOMATOUS PATIENTS
A. Zambelli, M. Iester, M. Mete, M. Avalone, G. Corallo,
G. Calabria
Clinica Oculistica Department of Neurosciences Ophthalmology
and Genetics, University Of Genoa, Italy

Purpose: To evaluate the correlation and the clinical agree-
ment among standard automated perimetry (SAP; Humphrey
Field Analyzer 750 – HFA; Carl Zeiss Meditec Inc.), Frequency
Doubling Technology (FDT; Welch Allyn Inc., Skaneateles, NY;
Zeiss - Humphrey, San Leandro, CA) and Rarebit Perimetry
(RBP) in glaucoma patients by a cross-sectional study.
Methods: Thirty-six consecutive patients with primary-open
angle glaucoma (POAG) were included in this study. One eye
of each patient was randomly chosen for data analysis.
Visual fields were assessed by SAP (HFA 30-2 full-threshold
program), FDT (full-threshold C-20 program) and RBP
(Rabbit Visual Field Test program). Mean deviation (MD) and
pattern standard deviation (PSD) of both HFA and FDT were
considered for the analysis. Among RBP parameters, mean
hit ratio percentage (HR%), mean hit ratio standard devi-
mation (HR-sd), number of hit ratio (num-HR), hit ratio peri-
centage (HR%), hit ratio standard deviation (HR-sd), time
test and mean reaction time (MRT) were considered.
The data were analyzed by descriptive analysis and Pearson’s r
coefficient was used to correlate perimetric results and
Bonferroni correction was applied. Kappa statistic was used
to study the agreement among the three different tech-
niques.
Results: The average HFA-MD and HFA-PSD values were
-1.86 db ± 4.7 (mean ± standard deviation) and 3.6 db ±
4.3 respectively. The average FDT-MD and FDT-PSD were
-4.62 db ± 4.95 and 5.88 ± 3.10. The mean RBP-MHR was
-1.86 db ± 4.7 (mean ± standard deviation) and 3.6 db ±
4.3. Significant correlation was found between
HFA-PSD and FDT-PSD (r = 0.601, P < 0.001), HFA-PSD
and FDT-MD (r = 0.936, P < 0.001). The most significant correla-
tions between HFA and RBP were found between HFA-MD and
MHR-% (r = 0.757, p < 0.001), HFA-MD and MHR-SD (r = -0.761, p < 0.001) and HFA-PSD and MHR-SD (r = 0.738, p < 0.001). The most significant (p < 0.001) correlations among FDT and RPB parameters were observed between FDT-MD and MHR-% (r = 0.791) and FDT-PSD and MHR-SD (r = 0.720). The agreement between FDT and HFA and between HFA and RB was poor (Kappa = 0.194 and 0.138 respectively), while the agreement between FDT and RPB was slight (Kappa = 0.273).

Conclusions: RPB was correlated to FDT parameters, although they had a slight agreement, suggesting that both techniques evaluated different anatomical and functional substrate. Further studies are necessary to evaluate the actual potentially of RPB.

Poster Session 12
MANAGEMENT: SURGERY AND LASER TREATMENT

P142
SEQUENTIAL LASER IRIDOTOMY USING ARGON AND Q-SWITCHED 532-NM FREQUENCY DOUBLED NEODYMIUM (FD-ND) YAG LASERS: A PILOT STUDY
M.C. Aquino, P. Chew, J. See
National University Hospital, Singapore

Objective: The aim of this study is to evaluate the safety and efficacy of using argon laser and Q-switched 532-nm frequency doubled neodymium (fd-Nd) yag laser in sequential laser iridotomy (LI) of angle closure eyes.

Study design: Prospective non-randomized case series.

Methods: Ten eyes of 10 Asian patients with occludable angles by gonioscopy and anterior segment optical coherence tomography were included in the study. After baseline ophthalmologic examination and specular microscopy, sequential LI was performed using argon laser followed by Q-switched 532-nm frequency doubled neodymium (fd-Nd) yag laser using 400 - 500 µm spot size, 2.6 mJ power and 3 nanoseconds duration. Follow-up evaluation was performed at 1 week, 1 month, 3 months and 6 months intervals.

Results: One primary angle closure glaucoma (PAC), 5 primary angle closure (PAC) and 3 primary angle closure suspects were treated. There were 8 females and 2 males with mean age of 61.5 years. Average laser settings used were as follows: Argon 1.0W, 100ms, 21 shots; Q-switched 532-nm frequency doubled neodymium (fd-Nd) yag laser 2.66 mJ power, 3 nanoseconds, 4.3 shots. One out of 10 complained of moderate pain during the procedure. No intraocular pressure (IOP) spike was noted 1 hour post laser. IOP was stable from pre-laser of 15.36 mmHg to mean of 13.83 mmHg six months after treatment. Iridotomy site was patent in all patients during entire follow up period and LI size increased from 280µm to 400µm average on the 6th month. Only 2 patients had mild inflammation lasting for 1 week. There was no deterioration in visual acuity although 3 patients had mild nuclear sclerotic change by LOCS3 during 6 month. There was no deterioration in visual acuity although 3 months and 6 months intervals.

Conclusion: Using Q-switched 532-nm frequency doubled neodymium (fd-Nd) yag laser in sequential argon-Nd Yag laser iridotomy is safe and effective in the treatment of primary angle closure eyes.

Accepted for Poster Presentation, ARVO 2008.

P143
SELECTIVE LASER TRABECULOPLASTY IN OCULAR HYPERTENSION, PRIMARY OPEN ANGLE GLAUCOMA AND PSEUDOEXFOLIATIVE GLAUCOMA
E. Basar
Celal Bayar University, School of Medicine, Department of Ophthalmology, Manisa, Turkey

Purpose: To evaluate the efficacy of selective laser trabeculoplasty (SLT) in ocular hypertension (OHT), primary open-angle glaucoma (POAG) and pseudoexfoliative glaucoma (PXG).

Methods: Trabecular meshwork of 90 eyes (60 patients) with OHT (11 eyes), POAG (64 eyes) and PXG (15 eyes) were treated with Q-switched frequency doubled Nd-YAG laser(SLT). An average of 129 spots on 360 degrees (79 eyes) and 72 spots on 180 degrees (11 eyes) was applied. Main outcome measure was intraocular pressure (IOP) which was determined at baseline, 1 month (all eyes), 3 months (49 eyes), 6 months (30 eyes), 9 months (19 eyes). The most frequent indication was providing additional IOP reduction (67 eyes), followed with deferring surgery (23 eyes). SLT was applied as primary therapy in 31% of eyes; rest of the eyes were already on 1-4 (2.0 ± 1.6) topical glaucoma medicaments.

Results: Mean IOP was 22.5 ± 5.1 (15-41) mmHg at baseline, 18.0 ± 4.1 (9-36) mmHg at 1 month, 17.4 ± 3.8 (10-34) mmHg at 3 month, 16.4 ± 2.5 (12-21) mmHg at 6 month and 17.0 ± 3.1 (10-21) mmHg at 9 months. IOP decreased by 19.0% (4.5 ± 3.5 mmHg) at 1 month, by 22.6% (5.4 ± 7.7 mmHg) at 3 months, by 29.3% (7.2 ± 3.7 mmHg) at 6 months and by 29% (7.3 ± 3.8 mmHg) at 9 months. Rate of IOP decrease ≥ 20% was 43% at 1 month, 51% at 3 months, 73% at 6 months and 94% at 9 months. The rate of IOP decrease ≥ 20% was 43% at 1 month, 51% at 3 months, 73% at 6 months, 89% at 9 months. The overall success rate correlated significantly with baseline IOP at all time points (p < 0.01). Age of patient, number of spots and total energy delivered and central corneal thickness did not correlate with IOP reduction. When assessed separately OHT and POAG eyes responded better than PXG eyes, but this was statistically insignificant at all time points (p > 0.05).

Conclusion: RPB was poor (Kappa = 0.194 and 0.138 respectively), while the agreement between FDT and RBP was slight (Kappa = 0.273).

Conclusions: RPB was correlated to FDT parameters, although they had a slight agreement, suggesting that both techniques evaluated different anatomical and functional substrate. Further studies are necessary to evaluate the actual potentially of RPB.
Logistic regression. Predictive factors have been analysed with Cox proportional-hazards regression.

Results: Mean base IOP in SLT 180º group is 22.5 mmHg (SD 3.6) and final IOP is 17.2 mmHg (SD 3.7). Mean difference is 5.2 mmHg (23.1% reduction) (p < 0.0001). Mean base IOP in SLT 360º group is 21.6 mmHg (SD 2.6) and final IOP is 16.1 mmHg (SD 4.3). Mean difference is 5.5 mmHg (25.4% reduction) (p < 0.0001). No statistically significant difference are found between groups in survival curves. Incidence of post SLT increase in IOP has been 0% in SLT 180º group vs 15% in SLT 360º group (p = 0.17). After analysing different factors as predictors of final IOP in all eyes, only IOP measured in the first week from treatment seem to do it in a statistically significant level.

Conclusion: In previously operated eyes SLT 180º is as effective as SLT 360º. There seem to be more side effects in SLT 360º group than in SLT 180º group with no statistically significant difference.

P145

OUR EXPERIENCE TREATING MALIGNANT GLAUCOMA BY CAPSULOHYALOIDECTOMY WITH THE ND-YAG LASER

A. Carceller Guillamet, A. Dou Saez de Vizmanos, J. Moreno Sanz, E. Coronado Quitilte
Hospital Vall d’Hebron, Barcelona

Purpose: To evaluate the efficacy of Nd-YAG laser capsulohyaloidectomy treating post trabeculectomy malignant glaucoma (MG).

Methods: Retrospective study of 5 clinical cases of post trabeculectomy MG in pseudoaquatic patients. We reviewed data from the Clinical History and gathered the pre and post laser photographs to compare the Anterior Chamber depth.

Results: No signs of MG were detected on the first day postop exam. Signs of MG appeared between days 3 and 30 postop. The initial IOP varied from 15 to 55 mmHg. All of the patients presented with different degrees of atalasia (iridocorneal contact in all) and 3 out of 5 with ocular hypertension. After the Nd-YAG laser the Anterior Chamber reformed immediately in all 5 cases and the IOP lowered in less than 30 minutes to 12-16 mmHg. The condition recurred in 3 patients, because of vitreous blocking the passage to the anterior chamber, and was solved widening it or performing another capsulohyaloidectomy in a different position. In one of these 3 cases the MG glaucoma recurred twice more and a central vitrectomy and surgical capsulohyaloidectomy has solved the problem. No complications due to the laser treatment were observed.

Conclusions: In our experience, the Nd-YAG laser has been effective to immediately revert the signs of MG or Aqueous Misdirection syndrome. There were no complications due to the treatment but retroetement was necessary in more than a half of the cases.

P146

THE EFFECTS OF INTRAVITREAL BEVACIZUMAB (AVASTIN) ON IRIS NEOVASCULARIZATION AND NEOVASCULAR GLAUCOMA

D. Cotlear, E. Rechtman, M. Goldenfeld, J. Glovinski, J. Moisseiev, A. Alhalel, S. Melamed
Goldschleger Eye Institute, Sheba Medical Center, Tel-Hashomer, Israel

Introduction: Small case series have suggested a beneficial effect of intravitreal anti-VEGF bevacizumab (Avastin), in treating iris neovascularization (NVI) and neovascular glaucoma (NVG).

Purpose: To evaluate the safety and efficacy of intravitreal bevacizumab in the treatment of NVI and NVG.

Methods: A retrospective review of all patients with NVI with or without NVG secondary to ischemic retinal diseases, treated with intravitreal bevacizumab, at Sheba Medical Center, Israel, who had a follow-up greater than a month. The study was approved by the Sheba Medical Center Helsinki committee.

Results: Eleven patients (8 males), at age 70.2 ± 9.7 (mean ± SD) years, were included. Nine had a follow-up of > 3 months. All were treated with intravitreal Avastin (1.25 mg/0.05cc) at the operating room and none needed paracentesis or had no light perception immediately after the injection. All were treated also with panretinal photocoagulation. The primary retinal causes of the neovascularization were: Central retinal vein occlusion (4 cases), proliferative diabetic retinopathy (3 cases), ocular ischemic syndrome (3 cases) and combined branch retinal artery and vein occlusion (1 case). NVIs were seen at baseline in 10 study eyes. At least 7 eyes had NVAs with closed angles at baseline. Baseline visual acuity ranged from 6/30 to light perception. Study eye baseline IOP was 35.5 ± 15 (mean ± SD; range: 12 to 68 mmHg; 7 eyes had IOP > 33 mmHg). A month after the Avastin injection, NVI disappeared in 8 eyes and the IOPs were reduced to 22 ± 10.75 mmHg (mean ± SD; range 9-45 mmHg). Despite the decrease in mean IOP and NVI, 6 eyes have undergone additional IOP lowering procedures, about a month following the Avastin injection (3 trabeculectomy and 3 cyclo-dioide laser photocoagulation) due to persistent elevated IOP on maximal tolerable medical treatment. Repeated Avastin injections were given in 5 eyes. In all patients, no ocular or systemic Avastin-related complications were seen.

Conclusion: Intravitreal Avastin was found to be safe and to have a short term benefit in treating NVIs secondary to ischemic retinal diseases. In most patients, however, it did not eliminate the need for additional antiglaucoma surgical procedure.
on their target could reduce their medications to 1.2. The average IOP pre SLT initial IOP: 21.583 ± 6.8322 post SLT day 1: 15.75 ± 3.6548 post SLT day 30: 16.29 ± 3.8541, mean diff: 5.29 ± 3.1673 SE mean 0.8584 p value < 0.001. Few cells were seen in the anterior chamber on the 1st post SLT day in 32 eyes. No PAS were seen in any patient at the end of 1 month.

Subgroup Analysis: patients who were subjected to primary SLT as a mode of therapy responded the best, recording a fall in IOP of 33.2% patients with NTG also responded with a drop in IOP of 31.6%. Those on prostaglandins did not respond as well.

Comparisons: Dr Madhu Nagar showed a mean IOP reduction as 25.6% for OAG and 33% for OHT. Laurie Barclay, showed a mean IOP decrease by 7.7 ± 3.5 mmHg (30%), from 25.5 ± 2.5 mmHg to 17.9 ± 2.8 mmHg (p <.001).

Conclusions: SLT is a safe, safe, alternative mode of treatment, especially where compliance is such an issue in glaucoma & the results of surgery are not predictable, with the fear of an Endophthalmitis always lurking at the back of our mind.

P148
TO ESTABLISH THE EQUIVALENCE OF THE TITANIUM SAPPHIRE LASER (TISLT) TO THE ARGON LASER (ALT) IN THE ABILITY TO REDUCE IOP IN PATIENTS HAVING PRIMARY OPEN ANGLE GLAUCOMA IN EYES WITH POORLY CONTROLLED IOP ON MAXIMALLY TOLERATED MEDICATIONS AND/OR PRIOR FAILED GLAUCOMA SURGERY
M. Goldenfeld1, S. Melamed1, G. Simon2, H. Levkovitch-verbin1
1 The Sam Rothberg Glaucoma Ctr, Goldschleger Eye Institute, Sheba Medical Ctr, Tel-Hashomer, Israel
2 Ophthalmic Research at the Boston University Photonics Center, USA, Instituto Gabriel Simon, Spain

Background: During argon laser trabeculoplasty (ALT), the heat diffusion (collateral zone of effect) significantly exceeds the penetration depth of the laser, and the thickness of the trabecular meshwork (TM). Selective laser trabeculoplasty (SLT) and TiSaLT, produce selective effects, where the heat remains localized, and the collateral zone of effect is limited and does not exceed the thickness of the TM. Both SLT and TiSaLT produce selective heating of pigmented trabecular meshwork (TM) cells with negligible heat diffusion to surrounding structures. TiSaLT can produce selective targeting of pigmented TM cells with a deeper penetration than SLT. Due to deeper penetration of the TiSaLT radiation (less strongly absorbed by melanin), TiSaLT reaches pigmented cells located deeper within the TM but does not have the thermal damage associated with the heat diffusion length (the collateral zone of effect) seen with ALT.

Methodology: 40 patients were included in the study. 20 were randomized to treatment with the ALT and 20 other with TiSaLT. Subjects were evaluated preoperatively and postoperatively at 1 hour, 2 hours (and hourly to 4 hours in the event of an IOP elevation in the immediate postop course), 1 day, 1 week, 1 month, 3 months and 15 months.

Results: The patients in the TiSaLT arm had an average of 8.3 (± 2.7) mmHg or 32% reduction from pre-operative IOP (p < 0.05). TiSLT patients had statistically significant fewer IOP spikes compared to the ALT group. (p = 0.002). Two patients (1 in each arm) underwent trabeculectomy and were considered failures. Mean follow-up time was 15 months.

Conclusions: TiSaLT is at least as safe & effective as ALT. TiSaLT produce selective heating of pigmented trabecular meshwork (TM). Selective laser trabeculoplasty (SLT) and TiSaLT produce selective effects, where the heat remains localized, and the collateral zone of effect is limited and does not exceed the thickness of the TM. Both SLT and TiSaLT produce selective heating of pigmented trabecular meshwork (TM) cells with negligible heat diffusion to surrounding structures. TiSaLT can produce selective targeting of pigmented TM cells with a deeper penetration than SLT. Due to deeper penetration of the TiSaLT radiation (less strongly absorbed by melanin), TiSaLT reaches pigmented cells located deeper within the TM but does not have the thermal damage associated with the heat diffusion length (the collateral zone of effect) seen with ALT.

P150
EFFICACY OF SELECTIVE LASER TRABECULOPLASTY (SLT) IN PATIENTS WITH PRIMARY OPEN ANGLE GLAUCOMA: ONE YEAR EXPERIENCE
M. Kynigopoulos, A. Tzamalis, T. Schlote
Clinic Pallas, Olten, Switzerland

Aim: To assess the efficacy of SLT in patients with open angle glaucoma (OAG) over a period of one year.

Methods: 45 eyes (27 with primary OAG, 10 with ocular hypertension, 5 with pseudoexfoliative- and 3 with pigmentary glaucoma) of 31 patients (mean age 66 ± 12.1 years) underwent a SLT (532 nm Q-switched Nd:Yag Laser, Ellex) with 50 non confluent spots over 180° of the trabecular meshwork. Intraocular pressure (IOP) was statistically analysed at baseline and 1, 3, 6 and 12 months after treatment. The criteria of success were fulfilled if IOP was reduced to a level under 21 mmHg, either by reduction of more than 5 mmHg from the pre-laser IOP. The mean IOP reduction at 1 day, 1 week, 1 month, 3 months and 6 months was 39.4% (9.7 ± 4.8 mmHg), 22.8% (5.6 ± 4.4 mmHg), 22.4% (5.5 ± 3.8 mmHg), 24% (5.9 ± 3.4 mmHg) and 23.2% (5.7 ± 3.5 mmHg) respectively.

Conclusions: SLT is a safe and effective procedure for IOP lowering in patients with PAC or PACG with a patent PI.
ications were reduced. In 8 eyes (17.8%) SLT had to be re-
peated. The success criteria were fulfilled in 55.6% of the
cases. No complications occurred.
Discussion: SLT appears to be a simple and effective method
for IOP reduction and a safe treatment option in patients with
open angle glaucoma.

P151
SLT - 12 MONTHS RESULTS
J. Nemcansky, P. Haidova, P. Masek, D. Cholevik
1 The Oph. Dpt., The Teaching Hospital Ostrava, Czech Republic

Purpose: The aim of the study was to determine the effect of
the selective laser trabeculoplasty (SLT) on IOP and on the lo-
cal therapy in glaucoma patients 1 day, 1 month and 3 to 12
months after the treatment.

Methods: The 113 eyes of 60 patients in the age 18 - 88
years had been treated by selective laser trabeculoplasty, in-
cluding patients with POAG, PEX glaucoma and pigmentary
glaucoma. The patients had been treated on average by 2.1
medications before SLT. We did not have any exclusion crite-
ria. The IOP was measured in the morning hours by
Goldmann application tonometry and the average IOP before
treatment was 19.7 mmHg. All the patients were treated by
brimonidine and oxybuprocaine immediately before the SLT
treatment. Then we applied 400 um large burns to the extent
of 180° - 360° and the total energy used was 44 - 144 mJ.

Results: The average decrease in IOP observed was 4.6
mmHg 1st day, 2.2 mmHg 1 month, 2.0 mmHg 3 months, 1.5
mmHg 6 months and 1, 4 12 months after the treatment. The
number of drugs used in local therapy decreased by 0.3. We
observed significant differences in effect on the patients.

Conclusions: We expected greater effect on both the IOP and
lowering number of medications. Nonetheless SLT has proven
as a valid and efficient method in lowering IOP in certain indi-
viduals. We assumed this results from several reasons. First,
there remains a considerable scepticism about SLT methods
in the region and consequently most of the patients treated
had had decompensated glaucoma using 2 and more anti-
glaucoma drugs before treatment. Second, we did not
have any exclusion criteria, which proves that careful selec-
tion of patients is needed.

P152
THE ROLE OF SELECTIVE LASER TRABECULOPLASTY AS
AN ADJUNCT TO MAXIMAL MEDICAL THERAPY
A. Doyle, E. Ng, M. Quirke, A. Collum, L. Collum
Royal Victoria Eye and Ear Hospital, Dublin, Ireland

Objectives: To evaluate the intraocular pressure (IOP) lowering
effect of selective laser trabeculoplasty (SLT) in progressive glau-
comatous eyes that are on maximal medical therapy (MMT).

Methods: All consecutive eyes with open angles that had pro-
gressive glaucoma in spite of being on MMT were offered SLT.

Results: 56 eyes were treated. Mean pre-SLT IOP of Group A
(n = 37) was 25.5 mmHg and Group B (n = 19) was 13.8
mmHg. At 6 months, 68% of Group A eyes maintained a lower
IOP (mean decrease 7.6 mmHg). In contrast, only 42% of
Group B eyes maintained a lower IOP at 6 months (mean de-
crease 2.1 mmHg). However, 29% of Group A eyes required
filtration surgery within 1 year of SLT while only 15% of
Group B eyes went on to have surgery. Mean number of ac-
tive anti-glaucoma agents used topically was unchanged pre
and post-SLT (Group A = 3.3; Group B = 2.5).

Conclusion: SLT effectively decreased IOP of eyes with a pre-
SLT IOP of ≥ 18 mmHg. Nonetheless, the IOP lowering effect
of SLT was insufficient for eyes with progressive glaucoma
and already on MMT, to significantly delay the need for filtra-
tion surgery.

P153
EFFECT OF DIODE LASER TRANS-SCLERAL CYCLOPHOTOCOAGULATION IN THE MANAGEMENT OF SILICONE OIL-INDUCED RAISED INTRAOCULAR PRESSURE
N. Planas, P. Carnota, S. Sanz, J. Lillo, L. Martinez, C. Masuet
MD, Spain

Purpose: To evaluate the effect of trans-scleral cyclophotoco-
agulation (TSCP) on intraocular pressure (IOP) in eyes with
silicone oil-related raised IOP refractory to medical treatment.

Methods: Medical records of 20 eyes of 20 patients who under-
grew TSCP at Hospital Universitari de Bellvitge between June
2001 and April 2007 were reviewed retrospectively. Diode laser
contact TSCP was performed at a power setting of 1.5-2.5 W,
for a maximum duration of 2.5 seconds, and with a total of 12
to 24 applications, delivered to 3 quadrants. Visual acuity, IOP,
secondary symptoms, number of glaucoma medications, and
success rate were evaluated. We defined complete success as a
final IOP equal or lower than 21 mmHg without glaucoma med-
ication, and qualified success as a final IOP equal or lower than
21 mmHg regardless of medication. In patients with no light
perception, the procedure was also classified as a complete
success if secondary symptoms disappeared.

Results: The patients were followed up for a mean period of
20.15 months (range 6-46 months). The mean pre-treatment
IOP was 35.8 mmHg (Std. Deviation 10.19) (range 25-60
mmHg). This reduced to 19.17 mmHg (SD 8.41) (range 6-43
mmHg) after TSCP (p < 0.01, Student’s paired t-test). The to-
tal number of glaucoma medications being used reduced from
3 (Interquartile Range 2) to 1.16 (IR 1.88) (p < 0.01,
Wilcoxon Signed Ranks Test). Use of oral acetazolamide for
the control of IOP was reduced from about 8 (40%) patients pre-
cyclodiode to 0 patients at 6 months. Four eyes required a second sitting of
TSCP, and two of these required a third sitting. A mean of 1.40
sittings (range 1-3 sittings) per eye were required. Qualified
success was achieved in fifteen eyes (75%) and complete suc-
cess in nine (45%). Any patient had hypotony (defined as IOP
of less than 5 mmHg) at 6 months of follow-up.

Conclusions: Patients with medically uncontrolled silicone oil-
induced raised IOP can be treated with TSCP; however, the
reduction of IOP is variable. Further studies are required
to determine if reduction of IOP will be maintained long-term.
The data were analyzed with two-way ANOVA and covariance. For comparative analyses t-Student and U Mann-Whitney tests were used in dependent and independent trials.

Results: The mean values of IOP in daily recordings were 18.1 ± 3.5 mmHg before surgery and 12 months after operation 12.9 ± 1.9 mmHg in group I (p < .05). Daily variations of IOP before surgery were 5.3 ± 2.6 mmHg, 95% CI (4.1-6.4), but 12 months after operation 2.4 ± 1.2 mmHg, 95% CI (2.1-2.7). With probability of making an error p = .000 we can say that mean IOP fluctuations after surgery are less than 3.5 mmHg. The mean values of IOP in daily recording in group II before starting of the medication were 17.4 ± 4.5 mmHg and after starting of the medication 15.0 ± 3.8 mmHg (p = .005).

IOP fluctuations before starting of the medication were 4.8 ± 3.7 mmHg, 95% CI (3.5-6.1) and after starting of the medication 3.9 ± 1.9 mmHg, 95% CI (3.4-4.3). With a small probability (p = .044) we can say that IOP fluctuations are equal or less than 3.5 mmHg. There is statistically significant difference between of IOP fluctuations between both studied groups (p < .05).

Conclusions: Phacodeepsclerectomy allows for effective control of IOP and elimination of IOP fluctuations over 3.5 mmHg. Prostaglandins allow to control of IOP, but they increase the likelihood of IOP fluctuations below 3.5 mmHg.

P156
IMPLANTATION OF A NOVEL GOLD SHUNT TO THE SUPRA-CILIARY SPACE IN GLAUCOMA PATIENTS - A PROSPECTIVE RANDOMIZED STUDY

S. Melamed1, G. Simon2, M. Goldenfeld3
1 The Sam Rothberg Glaucoma Ctr, Goldschleger Eye Institute, Sheba Medical Ctr, Tel-Hashomer, Israel,
2 Ophthalmic Research at the Boston University Photonics Center, Instituto Gabriel Simon, Spain, 3 The Sam Rothberg Glaucoma Ctr, Goldschleger Eye Institute, Sheba Medical Ctr, Tel-Hashomer, Israel,

Background: A novel approach to enhance uveo-scleral outflow and reduce IOP in glaucoma patients. We implanted an ultra-thin shunt made of 24 K gold which contains tubules communicating the anterior chamber to create aqueous flow into the supra-ciliary space. The Gold Mini Shunt (GMS) is implanted through a cut in the peripheral limbal area into the anterior chamber anteriorly, and to the supra-ciliary space posteriorly, avoiding a bleb formation.

Inclusion Criteria: Uncontrolled glaucoma patients with IOP > 22 mmHg despite maximally tolerated medical treatment or previous glaucoma surgeries. C/D ratio > 0.6 with visual field defects attributed to glaucoma. Eyes with corneal pathology, active inflammation or severe retinal pathology were not allowed into the study.

Results: Average pre operative IOP was 26.19 mmHg & at last follow-up IOP was 18.57 mmHg (reduction of 40.36%). The mean number of glaucoma medications decreased from 2 to 1.38. Complications: No major complications associated with the implantation of the GMS. There was no change of visual acuity after the operation in those eyes which had useful vision, nor was there any deterioration of visual fields. There was not a single case of Suprachoroidal Hemorrhage or ciliary body bleeding. One patient has an erosion of the shunt, where the shunt was erroneously placed in the sclera with its tail reaching sub-conjunctival space. This shunt was removed after 6 months, and a new GMS was successfully implanted in adjacent quadrant. There was 1 case of exudative Retinal Detachment associated with inferior choroidal effusion which persisted for 5 months with IOP of 8 mmHg. 6 cases had a minimal hyphema of less than 2 mm, which subsided within 1 week. No severe hyphema or other intra-ocular bleedings were detected. In 4 of 47 eyes, after

P155
INTRAOCULAR PRESSURE FLUCTUATIONS AFTER SUCCESSFUL PHACODEEPSCLERECTOMY AND IN PATIENTS TREATED WITH PROSTAGLANDINS

B. Fuksińska, M. Rękas, A. Stankiewicz
The Departament of Ophthalmology, Military Health Service Institute in Warsaw, Poland

Purpose: The comparison of intraocular pressure (IOP) fluctuation in patients after successful phacodeepsclerectomy and treated conservatively with prostaglandins.

Methods: 131 eyes of 78 patients with POAG and secondary glaucoma due to PEX were retrospectively analyzed. In group I (FSKgel) there were 39 patients with the total of 55 eyes after phacodeepsclerectomy. All the patients in group II were treated conservatively with prostaglandins.

Results: The mean age at surgery was 73 years. The mean axial length was 19.57 mm (range = 15.30 to 21.87 mm), the mean anterior chamber depth was 1.67mm and the mean lens thickness was 5.14 mm. At 3 month follow-up period, there was an improvement of a mean of 2.16 snellen lines. No eyes had reduced vision. The mean pre-op IOP was 23.67 mmHg with four patients on oral acetazolamide. The mean post-op IOP was 13.83 mmHg with only one patient requiring oral acetazolamide. There were no intraoperative complications. One patient developed transient vitreous haemorrhage which resolved spontaneously.

Conclusion: VPPI is an effective technique in safe removal of bulky cataracts causing phacomorphic angle closure in small eyes.
Conclusions: Silicone and polypropylene AGVs have similar complications, were observed more frequently in the group S, but no significant difference between the two groups. Complications, including non-tube-related complications, were the eyes that had minimal hyphaema. In 1 eye the Descemet Membrane was found to cover part of the GMS, this eye required immediate Nd-YAG laser treatment to open the Descemet and expose the shunt inside the AC which resulted in immediate IOP reduction.

Conclusions: The implantation of the Glaucoma Gold Mini Shunt into the supraciliary space was found to be safe and effective.

P157
MODIFIED SCLERAL TUNNEL TRABECECTOMY IN GLAUCOMATOUS EYES WITH TRACHOMATOUS DRY EYE
M. Guzey, A. Satici
Harran University School of Medicine Department of Ophthalmology Sanliurfa, Turkey

Purpose: To report on the surgical outcome of Modified Scleral Tunnel Trabeculectomy (MSTT) in glaucomatous eyes with trachomatous dry eye.

Methods: 32 eyes of 32 patients with primary open angle glaucoma and trachomatous dry eye underwent MSTT. The surgical procedure involved hydrodissection of fornix-based conjunctival flap, 2.5 x 2.5 mm sclerocorneal tunnel with 1 mm side incisions and punch trabeculectomy. The flap is closed with two polyglactin corner sutures.

Results: Mean preoperative intraocular pressure (IOP) was 29.6 ± 7.8 mmHg. After 8-32 months (17.2 ± 5.1) of follow-up, IOP was 19 mmHg or less in 28 eyes (87.5 %) and the mean IOP was 14.1 ± 4.4 mmHg (8-22). There were postoperative complications; 2 eyes had a shallow anterior chamber, 2 had IOP above 21 mmHg, 1 eye had hyphaema, 2 had early aqueous leakage and 1 eye had no filtration bleb.

Conclusions: MSTT in glaucomatous eyes with trachomatous dry eye was found efficacious and safe. MSTT as a modified drainage procedure can be choice for surgical treatment of refractory open angle glaucoma in patients with dry eye and scarring conjunctival diseases.

P158
COMPARISON OF SAFETY AND EFFICACY BETWEEN SILICON AND POLYPROPYLENE AHMED GLAUCOMA VALVES
J.Y. Jung, S.H. Bae, H.K. Kim, Y.H. Sohn
Kim's Eye Hospital, Korea

Purpose: To compare the safety and efficacy of propylene and silicone Ahmed glaucoma valves (AGVs).

Methods: The medical records of 62 consecutive refractory glaucoma patients who had undergone AGV implantation from March 2003 to December 2005 were reviewed retrospectively. Among the 62 patients, 32 patients underwent propylene AGV implantation (group P) and the other 30 patients underwent silicone AGV implantation (group S). Postoperative IOP, the complication rate, and the success rate were compared between the two groups.

Results: The life-table success rates for the group P were 71.2% at 12 months and 63% at 24 months, and the success rates for the group S were 78.6% at 12 months and 75% at 24 months, showing no significant difference between the two groups. Complications, including non-tube-related complications, were observed more frequently in the group S, but there was no significant difference between the two groups.

Conclusions: Silicone and polypropylene AGVs have similar results with respect to both safety and efficacy in the treatment of patients with refractory glaucoma.

P159
AB EXTERNO INTRASCLERAL INJECTION OF STABILIZED NON-ANIMAL HYALURONIC ACID ON OUTFLOW FACILITY OF ISOLATED PORCINE EYES
N. Mavrakanas, E. Sharkawy, T. Shaarawy
Glaucoma Surgery Research Laboratory, Eye Clinic, Geneva University Hospitals, Switzerland

Purpose: To investigate alterations of the outflow facility in isolated porcine eyes after an intrascleral injection of stabilized non-animal hyaluronic acid gel.

Methods: The experiments were performed on isolated porcine eyes. The number of eyes to be tested for each possible combination of needle size (21G, 23G, 27G) and canal length (4mm and 6mm from the limbus) was fixed to 10, so that 60 eyes were totally tested (6 possible combinations). A total number of 10 eyes were used as control group. After cannulation of the eye, the inflow rate was adjusted until pressure of the system reached 10 mmHg. When a stable level of pressure was achieved, the hyaluronic acid gel was injected. The inflow rate was then increased until pressure reached 20 mmHg. Once this pressure level was achieved, inflow rate was altered to reach a stable pressure of 30 mmHg. The infusion flow measurements were then plotted against the pressures in the system, using the Goldmann equation. One-way analysis of variance (ANOVA) was used to search any overall significant difference between the 7 groups in the 10-20 and the 20-30 level and to construct a 95% confidence interval for the mean of each group.

Results: A significant difference was found between group 5 and the control group in the 10-20 pressure level (p = 0.003). A significant difference was found between all groups and the control group in the 20-30 pressure level (p = 0.005).

Conclusion: Ab externo intrascleral injection of stabilized non-animal hyaluronic acid increases the outflow facility in isolated porcine eyes. This appears to be a promising new technique for lowering intraocular pressure by increasing the outflow facility.
gery (repeat Trabectome, laser trabeculoplasty, trabeculectomy, aqueous shunt installation, cyclophotocoagulation) occurred in 76/584 (13%). The cumulative probability of failure at 12 months among 81 patients with at least one-year follow-up was 33.8% (IOP > 21 or not reduced by 20% below baseline on two consecutive visits after 3 months).

Complications included transient reflux bleeding from Schlemm’s and collector channels in 73% but no prolonged hyptony, choroidal effusion, choroidal hemorrhage or infections.

IOP spikes postoperatively have been minimal if viscoelastic is thoroughly removed. Adjunctive medication use decreased in Trabectome-only cases from a mean preoperative number of 2.9 to 0.93 by 24 months. Among combined phaco-Trabectome eyes the mean base-line IOP was 19.6 mmHg and the mean decrease at 12 months was 24% to 14.9 mmHg (n = 10). Adjunctive medications decreased by 29% from a preoperative mean of 2.2 to a one-year mean of 1.55 (n = 24).

Conclusions: Trabectome surgery alone or combined with cataract extraction offers a minimally invasive method of improving IOP control and decreasing the need for adjunctive medications. An ARVO abstract is planned.

P161

EARLY POST-OPERATIVE REDUCTION OF THE INTRAOCULAR PRESSURE IN BAERVELDT GLAUCOMA DRAINAGE DEVICE SURGERY: THE RIETVELD SUTURE

R. Musken¹, E. Rietveld², N. Jansonius¹
¹ University Medical Center Groningen, University of Groningen, Groningen, The Netherlands, ²Free University Medical Center, Amsterdam, The Netherlands

Purpose: To report the results of a pilot study with the Rietveld suture, a surgical technique aiming to provide reduction of the intraocular pressure (IOP) in the early post-operative period after implantation of the Baerveldt glaucoma drainage device.

Methods: In 24 eyes of 22 patients with refractory glaucoma with very high pre-operative IOPs, a nylon 9-0 suture was placed through the wall of the tube of the Baerveldt drainage device beneath the donor sclera aiming to provide IOP reduction in the first 4-7 weeks after implantation, i.e., before the tube opens due to disappearance of the vicryl 7-0 ligature. 17 eyes of 14 randomly chosen patients untreated): 18 SD 5.5. Mean IOP at six months: 19.07 SD 3.6. Mean number of drugs: 0.9 SD 0.9. UBM detected fluid in the suprachoroidal space in 71.4% of the patients at one month and 42.86% at six months. 100% had fluid around the GGS at one month and 64.28% at six months. The peri-GGS fluid (hypoechogenic space between the GGS and the choroid) and peri-GGS fluid (hypoechogenic space between the GGS and the surrounding tissue). Study visits included measurements of IOP, however the UBM examiner was blinded to the IOP. Non-parametric test were used to compare continuous variables, the Chi-square test was used to compare categorical variables.

Results: Preoperatively UBM did not detect fluid in the suprachoroidal space in any eye. Baseline IOP: 21.7 SD 4.02. Mean number of topical drugs: 2.64 SD 0.6 (Systemic acetazolamide: 3/14 eyes). Mean IOP at one month (all patients untreated): 18 SD 5.5. Mean IOP at six months:19.07 SD 3.6. Mean number of drugs: 0.9 SD 0.9. UBM detected fluid in the suprachoroidal space in 71.4% of the patients at one month and 42.86% at six months. 100% had fluid around the GGS at one month and 64.28% at six months. The peri-GGS fluid could be seen as a slit-like hypoechogenic space around the GGS or/and as a intrascleral lake in the scleral incision area above the GGS. IOP was significantly lower in the patients with fluid in the suprachoroidal space.

Conclusions: UBM allowed us to detect peri-GGS and suprachoroidal fluid after GGS implantation. Long-term longitudinal studies are needed to confirm these findings and analyse the changes over time.

P162

EVALUATION OF THE SUPRACHOROIDAL SPACE AFTER GOLD GLAUCOMA SHUNT IMPLANTATION IN PATIENTS WITH UNCONTROLLED PRIMARY OPEN ANGLE GLAUCOMA USING ULTRASOUND BIOMICROSCOPY

J. Garcia-Feijoo, J.M. Martinez-de-la-Casa, F. Saenz-Francs, G. Olea, C. Mendez-Hernandez, A. Fernandez-Vidal, J. Garcia-Sanchez
Hospital Clinico Universitario San Carlos, Madrid, Spain

Purpose: To evaluate the suprachoroidal space after Gold Glaucoma Shunt (GGS) implantation in patients with uncontrolled POAG.

Methods: Prospective observational study. Inclusion criteria: Patients with POAG who were candidates for glaucoma aqueous shunt surgery after failed surgical glaucoma interventions. 14 eyes of 14 consecutive patients were included and underwent GGS implantation The Gold-Glaucoma-Shunt (SOLX-Corp) is a fine gold valveless flat drainage device (6 mm long, 3 mm wide. Interior channels diameter: 50 μm) designed to communicate between the anterior chamber and the suprachoroidal space allowing the aqueous to reach the suprachoroidal space. UBM exams (UBM 400; Zeiss-Humphrey) were performed preoperatively and 1 and 6 months postop. Hourly scans of the angle and the pars plana were taken, radial and transversal scans of the area where the GGS was implanted were also performed. We evaluated the presence of suprachoroidal fluid (hypoechogenic space between the choroid and sclera) and peri-GGS fluid (hypoechogenic space between the GGS and the surrounding tissue). Study visits included measurements of IOP, however the UBM examiner has blinded to the IOP. Non-parametric test were used to compare continuous variables, the Chi-square test was used to compare categorical variables.

Results: Preoperatively UBM did not detect fluid in the suprachoroidal space in any eye. Baseline IOP: 21.7 SD 4.02. Mean number of topical drugs: 2.64 SD 0.6 (Systemic acetazolamide: 3/14 eyes). Mean IOP at one month (all patients untreated): 18 SD 5.5. Mean IOP at six months:19.07 SD 3.6. Mean number of drugs: 0.9 SD 0.9. UBM detected fluid in the suprachoroidal space in 71.4% of the patients at one month and 42.86% at six months. 100% had fluid around the GGS at one month and 64.28% at six months. The peri-GGS fluid could be seen as a slit-like hypoechogenic space around the GGS or/and as a intrascleral lake in the scleral incision area above the GGS. IOP was significantly lower in the patients with fluid in the suprachoroidal space.

Conclusions: UBM allowed us to detect peri-GGS and suprachoroidal fluid after GGS implantation. Long-term longitudinal studies are needed to confirm these findings and analyse the changes over time.

P163

COMBINED TRABECULECTOMY WITH BETA IRRADIATION FOR UNCONTROLLED GLAUCOMA

M. M. Saif
Beni Sueif University, Egypt

Purpose: to evaluate the efficacy and safety of strontium 90 Beta-irradiation in 3 groups of glaucoma.

Principle: beta-irradiation is a high speed electron which is rapidly attenuated by biological tissues. It inhibits fibroblastic proliferation as well as endothelial growth necessary for healing of wounds.

Material and methods: 34 eyes divided into 8 congenital, 17 POAG, 9 pseudophakic glaucoma. Beta applicator was applied
at a distance of 2 mm in the congenital group and contact in other cases. The dose was 750 rad in children -1000 rad in adults with follow up for at least 30 month.

Result: analysis of the results statistically proved the efficacy, safety and on the long run cost benefit. The complications of beta irradiation and its cataractogenic effect on children when it is applied near the equator of the lens were avoided as far as possible. Failure categorised as the need for additional medical treatment or further surgery. Multiple regression models were used for the analysis of intraocular pressure; beta irradiation was associated with a significantly lower IOP at 6, 12, 30 months (p less than 0.05).

Conclusion: beta irradiation is safe and effective as in the 3 groups studied.

P164
RISK OF COMPLICATIONS IN PHACOEMULSIFICATION AFTER YAG LASER PERIPHERAL IRIDOTOMY - DOES USE OF THE ANTERIOR CHAMBER MAINTAINER REDUCES THE RISK?
Y. Sha, L. Jones, K. Gopee, D. Trivedi, R. Holder, V. Sung
Birmingham and Midlands Eye Centre, 3Birmingham City Hospital, United Kingdom

Purpose: Performing phacoemulsification in eyes with previous acute or chronic angle closure and YAG laser peripheral iridotomy (LPI) may be technically difficult because of several factors, including; a shallow anterior chamber, thick lens, high posterior pressure, posterior synechiae, small pupils, and weak zonules. The anterior chamber maintainer (ACM) has been shown to reduce the risk of complications by increasing the anterior chamber depth and maintaining the intraocular pressure during surgery.

Methods: We performed a retrospective case-notes review of patients who underwent both LPI and phacoemulsification surgery during the period, January 2000 and April 2000, identified from the hospital database. Various data were collected, including: demographic, clinical, biometric and surgical. We analysed these data, to compare the rate of intra- and post-operative complications between those patients who had an ACM and those who did not.

Results: A total of 101 patients were identified, 57 patient records (67 eyes) were available for analysis. There were 46 females and 11 males, with a mean age of 71.5 years (range from 50 to 91). The diagnoses were: 44 (65.7%) acute primary angle closure, 14 (20.9%) chronic primary angle closure glaucoma and 9 (13.4%) primary angle closure suspects. Twenty eight patients had phacoemulsification performed with the aid of a self retaining ACM [Lewicky] (group 1) and 39 patients without (group 2).

There was no statistical difference between the groups in terms of: age, biometrical data, pre-op visual acuity, IOP or the number of glaucoma drops. In group 1 (ACM), two patients (7.14%) had intra-operative complications (anterior capsule tears), compared to seven (18%) in group 2. These includes: abandonment of procedure, conversion to ECCE, iris prolapse, wound dehiscence, corneal haze, retention of soft lens matter, and high vitreous pressure. Seven patients (25%) in group 1 had post-operative complications compared to 16 (41.03%) in group 2. Complications in group 1 were: IOP > 30 mmHg, fibrinous uveitis, corneal oedema, CMO. In group, they were: IOP > 30 mmHg, fibrinous uveitis, corneal oedema, malignant glaucoma, ciliary body detachment, wound leakage, dissected IOL, hypotony, CMO.

Conclusion: The use of the ACM may reduce both intra-operative and post-operative complications of phacoemulsification in eyes with previous LPI for primary angle closure.
Background: Central corneal thickness (CCT) is a risk factor for Open-Angle Glaucoma (OAG). Evidence from twin studies indicates that CCT is highly genetically determined, but as yet the genes which account for CCT variation in normal individuals are unknown. Individuals with osteogenesis imperfecta (OI) are known to have markedly reduced CCT, due to mutation in either the COL1A1 or COL1A2 collagen genes. Aims: 1) Screen COL1A1 and COL1A2 in a large population-based cohort to determine if these genes determine CCT variation in normal individuals. 2) Determine the prevalence of POAG in a recruited population of OI patients. 3) Measure CCT in a mouse model of OI due to col1a2 mutation. Methods: COL1A1 and COL1A2 were screened using a haplotype tagging approach in 957 subjects with CCT measurements from the population based Blue Mountains Eye Study, Australia. Single Nucleotide Polymorphisms (SNPs) were selected from the HapMap database to cover the majority of genetic variation in these genes. Thirty-one OI patients were recruited from Genetics Services in Southern Australia and comprehensively examined for CCT and subjected to a glaucoma examination. A mouse model for OI with a deletion in COL1A2 (the oim mouse) exhibits skeletal defects in homozygous mutants. CCT measurements were taken in 19 wild-type and 10 homozygous mutant mice using the optical low coherence reflectometer. Results: Mean CCT in the Blue Mountains Eye Study population was 540 µm. One SNP (rs1034620) in COL1A2 was associated with a 5.6 µm difference in CCT in normal individuals (p = 0.01). No COL1A1 SNPs were significantly associated with normal CCT variation in our human cohort. OI cases had a mean CCT of 455 µm ± 48. A higher than expected number of OI patients had POAG some hitherto undiagnosed. Homozygous mutant oim mice had significantly thinner CCT when compared to the wild type animals (74.4 µm ± 7.3 vs. 87.7 µm ± 9.3, p = 0.0006). Conclusions: COL1A2 but not COL1A1 plays a role in determining CCT variation in normal individuals. POAG is found in OI patients possibly at a higher rate than in the normal population, and there is a strong likelihood of underestimating IOP due to the markedly reduced CCT in these individuals. Mutant oim mice had significantly thinner CCT than wild-type mice. The human and mouse data implicate COL1A2 in determining CCT, but further work is required to determine whether this gene is implicated in POAG beyond the effect on CCT.
family with moderate juvenile open angle glaucoma (JOAG) and Ala427Thr in a low-tension glaucoma (LTG) case. We identified the following single nucleotide polymorphisms (SNPs) in MYOC: Thr285Thr in a primary congenital glaucoma (PCG) patient; Gly122Gly in a LTG; Val426Val (novel) in a non treated OHT patient and eight patients with Tyr347Tyr of which 2 were JOAG, 2 primary closed angle glaucomas, 2 LTG, 1 non treated OHT patient and 1 PCG. CYP1B1 mutations were found in seven of eight unrelated patients with PCG either in the homozygous or heterozygous state. Three mutations were identified in exon 2: Arg48Gly, Gly61Glu, Ala119Ser and four in exon 3 namely His354fs, Thr403fs,Val432Leu and Asn453Ser. One patient presented with a concomitant MYOC polymorphism. The polymorphysm Ala119Ser has been associ- ated with some forms of breast or lung cancer.

Conclusions: The presence or absence of both MYOC and CYP1B1 mutations and polymorphisms strongly influenced our therapeutic attitude in order to prescribe or withdraw hypo- potensive drugs or other type of treatments to our patients. The genetic analysis helped us to provide a more accurate vi- sual prognosis as well as a genetic counselling. This information contributed to diminish the anxiety of the patients and their relatives.

P170

ASSOCIATION OF FUNCTIONAL CYP1B1 VARIANTS IN GERMAN PATIENTS WITH PRIMARY OPEN-ANGLE GLAUCOMA (POAG)

F. Pasutto1, G. Chavarria-soley1, K. Michels-rautenstrauss1, C.Y. Mardin1, L. Fernandez-martinez1, B. Rautenstrauss1, F.E. Kruse1, A. Reis1 1 Human Genetics, 2 Ophthalmology, University of Erlangen- Nuremberg, Germany

Purpose: Glaucoma, a major cause of blindness worldwide, is a complex and genetically heterogeneous disorder character- ized by progressive death of retinal ganglion cells. CYP1B1 is the major gene responsible for primary congenital glaucoma (PCG), a rare recessive blinding disease already manifesting in newborns. Autosomal dominant inheritance, though, with reduced penetrance was seen in about 40% cases of the adult form of open angle glaucoma (POAG). Recently, PCG associat- ed CYP1B1 mutations have also been observed in the heterozygous state in POAG patients in French, Canadian and Indian populations. We now investigate the reported association of CYP1B1 in a large cohort of German POAG patients. Methods: We investigated 399 unrelated glaucoma patients and 376 healthy subjects of comparable age and origin. Upon direct sequencing the entire CYP1B1 coding region we com- pared the frequency of observed variants. To assess their role as causative variants we performed in vitro functional assays of all CYP1B1 variants embedded in their respective founder haplotypes combining enzymatic activity and relative protein amount to determine relative enzymatic activity.

Results: Five known PCG variants (W57X, G61E, Y368H, and A443G) and five novel ones (P52L, G168D, N203S, G329W and V465A) were identified. Results of in vitro functional assays for variants G61E, N203S and P52L show strong reduction of relative enzymatic activity, confirming their role as loss-of-function mutations as previously reported for W57X and R368H. Variants Y81N instead showed an inter- mediate reduction, compatible with a hypomorphic allele, with a decreased function. These six variants, were present in 12 patients (3%) but only in 3 controls (0.8%; p = 0.034).

Conclusions: Our study suggests that heterozygous CYP1B1 mutations showing absent or reduced relative enzymatic ac- tivity are more frequent in German POAG patients than in controls and thus may represent a risk factor for POAG.

P171

CROSSLINKING OF THE ACTIN NETWORK CAN BE REDUCED BY ANTIOXIDANTS IN VITRO

U. Welge-Lüßen1, A.L. Yu2, F.E. Kruse1 1 Department of Ophthalmology, Friedrich-Alexander University, Erlangen Nürnberg, 2 Department of Ophthalmology, Ludwig-Maximilians University, München, Germany

Purpose: Previous studies have shown that primary open an- gle glaucoma (POAG) is characterized by crosslinking of the actin network (CLAN) in the trabecular meshwork. In the pathogenesis of POAG, oxidative stress and increased levels of transforming growth factor-beta2 (TGF-B2) are discussed. Additionally, it is discussed, that antioxidative treatment may help to lower the progression of glaucomatous disease. The goal of the present study was to determine the ability of TGF- B2 and oxidative stress to induce CLAN in cultured trabecular meshwork cells. Furthermore, we investigated the possible protective effect of various antioxidants on these glaucoma- tous changes of the cytoskeleton.

Methods: Cultured human trabecular meshwork cells were treated with 1.0 ng/ml TGF-B2 for 12 to 48 hours and with 100-400 µM H2O2. The cytoskeleton was visualized by phalloidin staining. To evaluate the effect of vitamin B1, B12, E, C, anthocyane and alpha lipoid acid, cells were pre incubat- ed with physiological concentrations before H2O2 and TGF-B2 treatment.

Results: Oxidative stress and TGF-B2 treatment increased the number of CLAN compared to untreated control cells. The ef- fect of oxidative stress and TGF-B2 was reduced when cells were pre incubated with 50 µm alpha lipoid acid and 100 µm anthocyane. In contrast, preincubation of human trabecular meshwork cells with vitamin B5, B12, C and E could not re- duce these stress-induced increase of CLAN formation.

Conclusions: The antioxidants anthocyane and alpha lipoid acid are able to reduce the oxidative stress- and TGF-B2-me- diated increase of CLAN formation in cultured trabecular meshwork cells. Therefore, the use of these antioxidants in glaucomatous patients may help to lower the incidence of characteristic changes in the trabecular meshwork.

P172

MYOC AND CYP1B1 EQUALLY AND INDEPENDENTLY CONTRIBUTE TO JUVENILE OPEN ANGLE GLAUCOMA

S. Yazdani1, B. Bayat2, M. Pakravan3, A. Alavi4, E. Elahi5 1 Shaheed Beheshti Medical University, 2 National Institute of Genetic Engineering and Biotechnology, 3 School of Biology, University College of Sciences, Tehran University, 4 National Institute of Genetic Engineering and Biotechnology, Tehran, Iran

Purpose: Mutations in MYOC and more recently, in CYP1B1 have been suggested to be associated with juvenile open an- gle glaucoma (JOAG) in various populations. Mutations in CYP1B1 are more often associated with primary congenital glaucoma. It has recently been shown that mutations in CYP1B1 are the cause of disease in 70% of Iranian PCG pa- tients. The purpose of this study was to investigate the role of MYOC and CYP1B1 mutations in Iranian JOAG patients.

Methods: Twenty-three JOAG patients were recruited. Their clinical features were assessed and familial cases were classi- fied according to mode of inheritance. Exons of MYOC and CYP1B1 were sequenced and novel variations were assessed in 100 control individuals. Potential disease associated varia- tions were tested for segregation with disease status in avail- able family members.

Results: The mode of inheritance of JOAG appeared to be au-
tosomal dominant in families of four probands (17.4%) and autosomal recessive in at least eight (34.8%) others. Four patients carried MYOC mutations and an equal number carried CYP1B1 mutations. The MYOC mutations were heterozygous and two of them were novel. Autosomal recessive inheritance was observed in families of patients carrying CYP1B1 mutations. All these patients carried homozygous mutations. Conclusions: MYOC and CYP1B1 contribute significantly, equally and probably independently to disease status in Iranian JOAG patients. For the first time, we report CYP1B1 mutations to be associated with JOAG in an autosomal recessive fashion.

Poster Session 15
NEUROPROTECTION AND APOPTOSIS

P173
THE PROTECTION OF THE RETINA FROM ISCHEMIA-REPERFUSION INJURY BY AGMATINE IN THE GUINEA PIGS
I. Koçer1, A. Daştan1, F. Erdogán1, O. Ates1, A. Kızıltunç2
1 Department of Ophthalmology, 2 Department of Pathology, Atatürk University, Turkey

Aim: To determine neuroprotective effect of Agmatine (Agm) on the retinas of the guinea pigs subjected to the transient ischemia-reperfusion insult.

Methods: 28 guinea pigs were randomly divided into four groups. Forty-five minutes before ischemic insult, guinea pigs were intraperitoneally administered with either Agm (50 mg/kg) or saline at once (Agm 1 and Control 1 groups) or twice at 12 hours (Agm 2 and Control 2 groups). The transient ocular ischemia was achieved under general anesthesia by cannulating the anterior chamber maintainer connected to an infusion line of semi flexible bottle. The saline reservoir pressure was risen using blood pressure tolls cuff, to increase the intraocular pressure (IOP) up to 150 mmHg. At this level IOP was maintained for 90 min. Reperfusion was achieved pull off anterior chamber maintainer. The animals in the Agm 1 and Control 1 groups were sacrificed at the end of 4-hours reperfusion period. The eyes were enucleated for histopathological (retinal thickness) and biochemical investigations. For the evaluation of oxidative stress, the reactive substance (TBARS) and Nitric Oxide (NO) were measured.

Results: In the Agm 1 and 2 groups, statistically significant increased retinal thickness and NO levels were observed compared with Control groups. TBARS levels were lower than Control 1 groups. In Agm 2 group, the retinal thickness and NO levels were higher than Control 2 group and Agm 1 group.

Conclusions: Agmatine exerts a significant neuroprotective effect in the guinea pig retinas in case of transient ischemia-reperfusion insult.

P174
DIFFERENTIATION OF RAT MESENCHYMAL STEM CELLS IN RAT RETINA
C.K. Park1, J.H. Kim1, H.Y. Lee1, S.M. Hyung1, K.R. Ju1, J.I. Moon1, M.D. Ahn1, N.H. Baek2
1 Department of Ophthalmology, College of Medicine, The Catholic University of Korea, Seoul, 2 Department of Ophthalmology, School of Medicine, Chungbuk National University Hospital, Cheongju, Korea

Purpose: We evaluated the differentiation potential of intravitreal and sub-retinal injection of rat bone marrow-derived mesenchymal stem cells (MSCs).

Methods: We transduced retroviral vector with rat-green fluorescent protein (GFP)-BDNF and -GFP viral vector to rat MSCs from rat marrow. Rats received one unilateral, intravitreal and sub-retinal injection of saline, retroviral-GFP, or retroviral-GFP-BDNF. Two weeks later, rat MSCs incorporation was evaluated in whole-mount and vertical section retinas by direct visualization of GFP. BDNF expression was assessed by real time RT-PCR.

Results: We observed rat MSCs injected intravitreal and sub-retinal to several layers of retina. BDNF expression was significantly increased in sub-retinal injection of retroviral-GFP-BDNF. Conclusions: From our study, we found the possibility of the treatment of glaucoma using mesenchymal stem cells.

P175
INFLUENCE OF SYSTEMIC GLUTATHIONE LEVEL ON THE RETINAL HSP70 EXPRESSION
M.H. Park, J. Moon
Department of Ophthalmology, College of Medicine, The Catholic University of Korea

Purpose: Heat shock protein (HSP)70 has been known to have neuroprotective effect on the retina in vitro and in a rat glaucoma model. This study was to evaluate the inducible HSP70 expression after oxidative stress induced by glutathione depletion in the mouse retina.

Methods: Unregulated oxidative stress was induced by depletion of intracellular glutathione by systemic administration of buthionine sulfoximine (BSO), an inhibitor of gamma-glutamylcysteine synthetase. After 0, 1, 4 and 7 days of BSO administration, we examined expression of HSP by real time RT-PCR, immunoblot, and immunohistochemistry assay.

Results: From analysis of RT-PCR and immunoblot assay, expression of HSP70 was observed in control group (Day 0) and significantly decreased from 1 day after BSO injection. Immunohistochemistry assay showed that expression of HSP70 was most prominent in photoreceptor layer among retinal layers and that depletion of glutathione decreased HSP70's expression to a great extent in the ganglion cell layer.

Conclusions: HSP seems to be play important role in prevention of oxidative stress induced retinal cell injury. But, sudden depletion of glutathione may decrease the expression of HSP70 by down regulation. And ganglion cell layer is more vulnerable to oxidative stress than the other layers in retina.

P176
KETOGENIC DIET AND KETONE BODIES OFFER NEUROPROTECTION OF RETINAL GANGLION CELLS IN RAT MODEL OF NMDA TOXICITY
T. Zarnowski1, T. Choragiewicz1, S. Thaler1, F. Schuttauf2, R. Rejdak1, E. Zrenner2
1 Department of Ophthalmology, Medical University, Lublin, Poland, 2 Clinic of Ophthalmology, University of Tuebingen, Germany

Purpose: Treatment of glaucoma using mesenchymal stem cells (MSCs).

Methods: We transduced retroviral vector with rat-green fluorescent protein (GFP)-BDNF and -GFP viral vector to rat MSCs from rat marrow. Rats received one unilateral, intravitreal and sub-retinal injection of saline, retroviral-GFP, or retroviral-GFP-BDNF. Two weeks later, rat MSCs incorporation was evaluated in whole-mount and vertical section retinas by direct visualization of GFP. BDNF expression was assessed by real time RT-PCR.

Results: We observed rat MSCs injected intravitreal and sub-retinal to several layers of retina. BDNF expression was significantly increased in sub-retinal injection of retroviral-GFP-BDNF. Conclusions: From our study, we found the possibility of the treatment of glaucoma using mesenchymal stem cells.
Purpose: Ketone bodies (acetoacetate and β-hydroxybutyrate) produced endogenously during starvation have been shown to exhibit neuroprotective and antiepileptic properties in models of brain ischemia and experimental epilepsy. The aim of the study was to investigate neuroprotective properties of lithium acetoacetate, sodium β-hydroxybutyrate and ketogenic diet after NMDA damage of rat retinal ganglion cells.

Material and methods: Three groups of Brown-Norway rats were used for the study. One group of animals were fed with commercially available ketogenic diet for at least 2 weeks prior to experiments. Lithium acetoacetate in two doses: 250 mg/kg body weight and 62.5 mg/kg (¼ dose), sodium β-hydroxybutyrate in molar equivalent of the lithium acetoacetate dose (291.2 mg/kg) and 72.8 mg/kg, (¼ dose) or phosphate buffer saline were administered intraperitoneally once a day for 21 days. On the day 14th animals received intraocular administration of NMDA (2 µl of 10mmol/l solution in PBS). Two days before preparation retinal ganglion cells were labeled with Fluorogold utilizing a retrolabelling method. On the 21st day rats were sacrificed, retinas were dissected out, retinal ganglion cells counts per mm² were compared to control.

Results: Number of retinal ganglion cells in retinas from animals treated with ketogenic diet, lithium acetoacetate or sodium β-hydroxybutyrate in full doses were significantly higher (49.2%, 48.4% and 41.5% increases, respectively) (p < 0.001, ANOVA) than in those treated with PBS. However, ¼ doses of both substances turned out to be ineffective.

Conclusion: Ketogenic diet, lithium acetoacetate and sodium β-hydroxybutyrate are neuroprotective in a rat model of retinal ganglion cells damage after intraocular injection of NMDA. Further studies are needed to elucidate the neuroprotective role of the ketogenic diet in the treatment of normal tension glaucoma.

**Poster Session 16**

**NORMAL PRESSURE GLAUCOMA**

**P177**

**24-HOUR INTRAOCULAR PRESSURE AND BLOOD PRESSURE LEVELS WITH BIMATOPROST VERSUS LATANOPROST IN PATIENTS WITH NORMAL-TENSION GLAUCOMA**

L. Quaranta¹, T. Pizzolante¹, I. Riva¹
¹ Glaucoma Unit, University of Brescia, ² University of Brescia, Italy

Purpose: To evaluate 24-hour intraocular pressure (IOP) and blood pressure (BP) with bimatoprost or latanoprost in patients with normal-tension glaucoma.

Methods: It was a prospective, randomized, crossover, active-controlled, observer-masked study. After a 6 week medicine-free period, we randomized patients to either latanoprost or bimatoprost for 8 weeks and then to the opposite medicine for 8 weeks. At baseline, and at the end of each treatment period, we evaluated IOP and BP at 08:00 and then every 2 hours over the 24-hour day. Diastolic ocular perfusion pressure (DOPP) was calculated from the above parameters.

Results: Forty completed patients had a 24-hour untreated baseline IOP of 15.5 ± 2.3 mmHg, and a DOPP of 59.2 ± 6.1 mmHg. Both treatments lowered IOP at each time point (p = 0.05).

Conclusions: In patients with normal-tension glaucoma both bimatoprost and latanoprost reduce the 24-hour intraocular pressure from untreated baseline to a similar extent. Latanoprost is associated with slightly improved ocular diastolic perfusion pressure over 24 hours.

**P178**

**AUDIT ON CARE PATHWAY FOR NORMAL TENSION GLAUCOMA**

P. Rajasekaran, T. Richardson, S. Ameen
Mayday University Hospital, Croydon, Surrey, United Kingdom

Purpose: To assess the care pathway for normal tension glaucoma (NTG) patients with a view to improve practice and develop a proforma.

Methods: There is a relative dearth in audit standards and best practice guidelines specific to NTG. The standards were modified from preferred practice patterns of American Academy of Ophthalmology for primary open angle glaucoma (POAG). Our audit was performed retrospectively reviewing notes of patients with NTG from the glaucoma clinic over 4 months and assessing whether or not the patients were dealt with according to NTG best practice patient guidelines. We designed a new proforma to comply with the set standards. NTG patients were then re-audited prospectively to assess change after implementation.

Results: History taking for POAG was documented in 86.6% after the proforma use as against 70.6% before. The documentation of history specific for NTG showed a vast improvement from 11.7% to 73.3% after proforma use. Preliminary examination for glaucoma was documented in all the notes. Examination for NTG was seen in 41.1% before proforma use as against 66.7% after. Plans for management were documented in a majority of patients both before and after proforma use. Other investigations were ordered in 23.5% before and 6.6% after re-audit. The major improvement in documentation was seen in the history and examination specific for NTG. The re-audit showed improvement in adhering to the best practice guidelines for work up of NTG after implementation of proforma. This has resulted in a change of practice in our unit that improved standard of patient care.

Conclusions: The use of a specific NTG proforma tool will most likely lead to enhanced diagnosis, and management of NTG patients. We suggest that this tool be developed for use in all glaucoma units.
and to three groups for GAT intraocular pressure (Group I < 10 mmHg, Group II 11-15 mmHg, Group III > 15mmHg).

Results: We found clear correlation between DCT measurements and Goldman or Tonopen XL measurements. Mean IOP measurements with dynamic contour tonometry were higher (16.5 ± 2.5 mmHg) (p < 0.0042) compared to GAT (13.5 ± 2.6 mmHg) (p < 0.0042) or Tonopen XL measurements (13 ± 2.25 mmHg) (p < 0.0041). These differences were higher in low CCT measurements and in intraocular pressures below 10mmHg or above 15 mmHg (p < 0.0001). GAT, DCT and Tonopen XL were not affected by corneal thickness but Goldman tonometry and Pascal tonometry were significantly influenced by corneal curvature (p < 0.004 and p < 0.0001 respectively).

Conclusion: Intraocular pressure by GAT or Tonopen XL were consistently lower when compared with DCT and this difference was greater with thinner CCT and in the lower range and upper range of intraocular pressure in normotensive glaucoma patients.

---

**Poster Session 17**

**NPDS / DEEP SCLERECOTOMY / VISCOCANALOSTOMY**

**P180**

**OCULAR HYPERTENSIVE CYTOMEGALOVIRUS UVEITIS TREATED WITH NON-PERFORATING DEEP SCLERECTOMY**


Barcelona, Spain

Purpose: To evaluate the efficacy of non-perforating deep sclerectomy (NPDS) for treating ocular hypertension in hypertensive uveitis.

Methods: We report the case of a patient affected of hypertensive uveitis without iris atrophy. Cytomegalovirus was detected by polymerase chain reaction in aqueous humour. Neither further findings, nor systemic involvement were detected. Usual topical treatment plus oral Valacyclovir were prescribed. As the IOP was uncontrolled with maximum topical treatment, a NPDS was performed.

Results: Once the antiviral treatment was completed and the surgical procedure done, the patient has either not presented new inflammatory episodes, and the IOP has remained well controlled without any medication after 3 years of follow-up.

Conclusion: The NPDS should be considered an successful technique to control the ocular hypertension in hypertensive uveitis.

**P181**

**NON PENETRATING GLAUCOMA FILTERING SURGERY WITHOUT SCLERAL IMPLANT. EFFICACY AND SAFETY DURING ONE YEAR FOLLOW-UP**

M.A. Teus1, E. Arranz-Marquez2, C. Marina-Verde3

1 Vissum Madrid, Hospital Universitario Príncipe de Asturias, Universidad de Alcalá, 2 Vissum Madrid, Universidad Europea de Madrid, 3 Vissum Madrid, Spain

Purpose: To study prospectively the safety and efficacy of non penetrating filtering surgery (NPFS) without scleral implant. Patients were followed during a one year postoperative period.

Methods: This is a prospective trial in which non penetrating filtering surgery was performed to 131 primary open angle glaucoma (POAG) eyes, (131 patients). The same surgeon performed all procedures using intraoperative Mitomycin C (MMC), and without placing any implant in the scleral bed. Main outcome measures were Goldmann applanation tonometry, number of postoperative complications, number of hypotensive treatments pre and postoperatively and best corrected visual acuity (BCVA). In all cases the same examiner obtained the measurements preoperatively and at every follow-up postoperative visit at one day, 1, 3, 6, 9 and 12 months.

Results: We found a reduction on IOP (p = 0.001) at every postoperative follow-up visit. Mean preoperative IOP (mmHg) was 20.2 ± 5.2, and postoperatively 12.3 ± 4.2, 13.7 ± 4.6, 13.7 ± 3.6, 14.2 ± 4.0, 14.1 ± 3.6, at 1, 3, 6, 9 and 12 months respectively. The mean number of medications was statistically reduced from 1.8 ± 0.7 preoperatively to 0.1 ± 0.4 at 1 year after deep sclerectomy was performed. Gonipuncture was performed in 31 eyes. 3 eyes were reoperated due to inadequate IOP control during the one year follow-up period. There was no statistically significant difference on BCVA postoperatively comparing with the preoperative values (p = 0.5).

Conclusions: During a one year follow-up period, non penetrating filtering surgery with intraoperative MMC, but without scleral implant, appears to provide reasonable control of IOP with few postoperative complications.
P183
RESULTS OF COMBINED PHACOEMULSIFICATION AND VISCOCANALOSTOMY IN CATARACTS ASSOCIATED WITH PSEUDOEXFOLIATIVE GLAUCOMA VERSUS PRIMARY OPEN ANGLE GLAUCOMA
K. Hassan1, M. Awadallah2
1 Fellow of Royal College of Surgeons, Edinburgh, United Kingdom, Magrabi Eye Hospital, Riyadh, Saudi Arabia, 2 Faculty of Medicine, Cairo University, Cairo, Egypt

Purpose: To study the outcome and the rate of intraoperative and postoperative complications of combined viscocanalostomy and phacoemulsification (phacoviscocanalostomy) in eyes with pseudoexfoliation glaucoma (PEXG) versus eyes with primary open angle (POAG) glaucoma.

Methods: A prospective comparative study that included 60 consecutive eyes of 60 patients with medically uncontrolled PEXG (30 eyes) or POAG (30 eyes) associated with visually significant cataract. Phacoviscocanalostomy was performed in all patients. Success rate based on postoperative intraocular pressure (IOP) reduction and requirement for topical antiglaucoma medications was evaluated as the main outcome measure. Visual acuity and complication rates were secondary outcomes.

Results: The mean follow-up was 19.7 months ± 7.01 (range 12 to 36 months). There was a statistically significant decrease in mean IOP in both groups at all postoperative follow up intervals (p < .05). At last postoperative visit, the mean percentage of IOP reduction was 49.8% in PEXG group, and 30.9% in POAG group. Complete surgical success (IOP ≤ 21 mmHg without medication) was achieved in 28 eyes (93.3%) in PEXG group, and 25 eyes (83.3%) in POAG group. Qualified success (IOP ≤ 21 mmHg with or without glaucoma medication) was achieved in all eyes (100%) of both groups. All patients in the study demonstrated significant improvement of uncorrected and best-corrected visual acuity postoperatively. Transient complications that did not affect the surgical outcome included: Descemet membrane microperforations, macroperforation, zonular dehiscence, vitreous loss, and postoperative transient IOP spike and iris plugging. No eye developed a trabeculectomy-type bleb, hyphema, fibrin exudation, or bleb-related complications. None required peripheral iridectomy, goniopuncture, or further glaucoma surgery.

Conclusion: Phacoviscocanalostomy achieved excellent IOP control and visual acuity improvement in both PEXG and POAG patients with coexisting cataract. PEXG group demonstrated lower IOP reduction and fewer postoperative antiglaucoma medications than POAG group. Complication rate was low and did not affect the surgical outcome. Therefore, phacoviscocanalostomy is an effective and safe surgical procedure that can represent an alternative to phacotrabeculectomy in both groups of patients.

P184
NON-PENETRATING VERY DEEP SCLERECTOMY WITH SODIUM HYALURONATE IMPLANTS AND MITOMYCIN IN THE TREATMENT OF ADVANCED CASES OF OPEN ANGLE GLAUCOMA
R. Leszczyński, E. Mrukwa-Kominek, E. Mielniczuk, J. Wójkow
Department of Ophthalmology, Medical University of Silesia, Katowice, Poland

Purpose: The purpose of the paper was to examine the efficacy and of non-penetrating very deep sclerectomy (NPVDS) with sodium hyaluronate implants and Mitomycin C in the treatment of advanced cases of open angle glaucoma.

Materials and methods: Forty eyes of 40 patients with medically uncontrolled advanced open angle glaucoma were retrospectively analyzed. Visual acuity, and intraocular pressure measurement were performed before and after surgery at 1 and 7 days and 1, 6 and 24 months. Visual field was analyzed before and 24 months after surgery.

Results: The mean preoperative intraocular pressure was 26.36 ± 7.09 mmHg and 14.5 ± 3.9 at 24 month after surgery (p < 0.0001). Visual acuity decreased more than two rows on Snellen chart in 4 patients. Visual field analysis shows mean defect MD-13.81 ± 6.9 before surgery and 13.89 ± 6.9 after 24 month of follow up (p = 0.45). Complete success rate defined as an IOP lower than 21 mmHg without medications and additional procedures was 67.5%. In 3 eyes we performed needling and in 8 goniopuncture. Postoperative complications included hyphaema in 2 eyes, choroidal detachment in 1 eye, bleb fibrosis in 2 eyes.

Conclusions: 1. Non-penetrating very deep sclerectomy with sodium hyaluronate implants and Mitomycin C provided good and safe control of intraocular pressure in patients with advanced cases of open angle glaucoma. 2. In uncomplicated cases it let us achieve stabilization of the visual field.

P185
DEEP SCLERECTOMY WITH COLLAGEN IMPLANTS WITHOUT ANTIMETABOLITES: LONG-TERM RESULTS
F. Marcoli, D. Minetti
Unità Operativa Oculistica, Istituto Clinico Mater Domini, Castellanza (VA), Italy

Purpose: To study retrospectively the success rate and complications in deep sclerectomy with collagen implant (DSCI) without antimetabolites.

Methods: In a nonrandomized retrospective study we examined the charts of 226 eyes with medically uncontrolled open angle chronic glaucoma submitted to DSCI. For each eye we reported the IOP value and the number of drugs before surgery, one day, 12 months, 24, 36, 48, 60, 72, and 84 months after surgery. We assessed the qualified and complete success rate. We defined as surgical success an IOP value lower enough to avoid the visual field loss.

Results: The follow-up was between 12 (226 eyes, 100%) and 84 months (12 eyes, 5.3%); 70 eyes (53%) reached 36 months of follow-up. Mean IOP was 25.8 ± 5.1 (SD) mmHg before surgery, 6.7 ± 4.2 (SD) mmHg on the first day (24 hours) after surgery, 12.3 ± 2.7 (SD) mmHg 12 months after surgery, 12.8 ± 3.9 (SD) mmHg at 36 months, and 13.0 ± 3.2 (SD) mmHg at 84 months. The overall success rate was 97.8% at 12 months, 95% at 36 months, and 85.2% at 84 months. Complete (without drugs) success rate was 86.9% at 12 months, 78.8% at 36 months, and 66.7% at 84 months. Eyes with preoperative IOP ≥ 30 mmHg didn’t have different results in term of complete and qualified success rate. The mean number of drugs per eye was reduced from 2.9 ± 1.0 (SD) before surgery to 0.2 ± 0.6 (SD) 12 months after surgery, 0.4 ± 0.7 (SD) 36 months after, and 1.0 ± 0.9 (SD) 84 months after DSCI. We didn’t have major complications, such as endophthalmitis or flat anterior chamber; 1 eye only (0.4%), highly myopic, had persistent hypotony for 1 month with spontaneous resolution. Nd:Yag laser goniopuncture was performed in 94 eyes (41.6%), and was complicated by incarceration of iris tissue in 8 eyes (3.5%) with narrow angle. The complication was related to a worst postoperative IOP value, and lower complete (2 eyes, 25%) and qualified (4 eyes, 50%) success rate at 36 months; 2 eyes (25%) required another filtering surgery.

Conclusions: Our experience indicates that DSCI appears to be a long-term effective and safe surgery in open angle glaucoma. Accurate selection of patients by anterior chamber an-
tion is done then deep scleral flab with right plane dissection you can reach the Schlemm’s canal easily with intact Descemet’s window and cutting of deep flab after that viscoelastic injection in Schlemm’s ostia, Transcilliary Filtration (TCF) is done 2 mm from Schlemm’s canal using Fugo Blade 100 micron filament to achieve microfiltration (100 micron pore by ablation of tissue, not cutting or cautering) then suturing of superficial scleral flab by two 10/0 vicryl sutures at both corners and reservoir filling with viscoelastic with 2 conjunctival sutures.

Results: Combined Viscoanaloneostomy And Transcilliary Filtration is a safe procedure keeping the advantage of non penetrating glaucoma surgery and augmenting its intraocular pressure lowering effect avoiding the complications of classic glaucoma surgery

Conclusion: Safe technique in managing glaucoma with high success rate and better visual rehabilitation and good target intraocular pressure in short term follow-up.

---

**Poster Session 18**

**OPTIC NERVE HEAD IMAGING, PSYCHOPHYSICS**

**P188**

**CLASSIFICATION OF OPTIC NERVE HEADS BY PARAMETERS OF RETINAL TOMOGRAPHY (HRT II)**

A. Akopyan1, V. Erichev2

1 Moscow Helmholtz Research Institute of Eye Diseases, 2 Experience Scientific-Research Institute of Eye Diseases of the Russian Academy of Medical Sciences, Russia

Purpose: To systematize optic nerve heads (ONH) from their shape, size and rim/cup relation to define the earliest glaucomatous changes.

Methods: 498 eyes of 303 patients were examined using the Heidelberg Retina Tomograph II. Vertical and horizontal diameters, slope of ONH were determined on X-, Y- and Z-axis values of ONH borders in interactive measurement. An index of ovality (IO) was calculated from relation of vertical diameter to horizontal.

Results: At IO values 0.75-1.35 the shape of ONH was approximately rounded. Despite of the variability in values of rim and cup parameters, caused by variability of ONH size (Spearmen’s coefficient R = 0.57; p < 0.01), the rim split into sectors in rounded discs had specific retinotomographic character, which corresponds to oftalmoscopic rule ISNT. However, in case of atypical discs (non rounded shape) the rim split into sectors changed, which made it difficult to differentiate the ONH condition between normal and pathology. Assuming this, we propose to classify atypical ONH in the following way:

1. Transversal disc (IO = 0.5 - 0.75);  
2. Longitudinal disc (IO > 1.35);  
3. Disc with large cup (disc area 1.5 – 3.0 mm²; IO = 0.75 - 1.35; cup area > 0.5 mm²);  
4. Sloping disc (with the inclination in horizontal axis > 300 microns);  
5. Prominating disc (cup is not defined);  
6. Large disc (disc area > 3.0 mm²; IO = 0.75 – 1.35).

Each shape of ONH characterized specific rim split in non-glaucomatous eyes and specific damage at glaucoma. Atypical ONH was, in it turn, divided into two groups: masking glaucomatous damage (sloping and prominating discs) and simulated glaucomatous damage (large, transversal, longitudinal ONH and discs with large cup).
P189
COMBINING STRUCTURAL AND FUNCTIONAL MEASUREMENTS IN THE CLINICAL ASSESSMENT OF GLAUCOMA
D. Crabb1, H. Zhu1, D. Garway Heath2
1 Department of Optometry and Visual Science, City University, London, 2 NIHR Biomedical Research Centre, Moorfields Eye Hospital and Institute of Ophthalmology, London, United Kingdom

Purpose: To develop and evaluate a clinically useful methodology to quantify and visualize structure-function concordance (SFC) in glaucoma.

Methods: Using 535 eyes from 3 different centres (Moorfields, London, United Kingdom; P Healey & P Mitchel (University of Sydney); D Anderson (RNFLT) profiles interact as ‘groups’ rather than as independent measures. A further data set (Bascom Palmer, Miami) of repeat measurements on 54 glaucomatous patients with 5 GDx (VCC) RNFLT scans and 5 Humphrey SITA VF tests were used to examine the performance of the method. A best available estimate (BAE) for the VF was constructed by taking the pointwise average of the 5 repeat VF, the BRBF method takes each single RNFLT profile to predict the VF. The difference between the prediction and the BAE was examined and compared to a randomly selected single VF versus the BAE. A novel SFC map was derived for each subject charting the correspondence between the predictions based on the RNFLT (structure) and the actual VF (function) for each subject.

Results: Mean absolute error for the prediction of the BAE VF was 4.5dB, as compared to 2.6dB for the difference between a single random VF and the BAE. A large proportion of predictions (41%) closely match the BAE VF with high SFCI (> 0.9), whilst 22% exhibit weak SFCI (< 0.7) indicating poor concordance between structure and function measurements.

Conclusion: Clinical decision in glaucoma involves the evaluation of structural and functional test results but can be misled by imprecision in these measurements: much could be gained by comparing and combing the data. Novel SFC maps highlight subjects with poor concordance between their structural and functional measures: they could be used to identify unreliable measurements or other clinically useful information.

Acknowledgements: H Lemij & N Reus (Rotterdam Eye hospital); P Healey & P Mitchel (University of Sydney); D Anderson & MJ Fredette (Bascom Palmer Eye Institute, Miami). Funded by an unrestricted grant from Pfizer Inc and the Moorfields Special Trustees.

P190
COMPARISON OF OPTIC DISC TOPOGRAPHY BETWEEN CASES WITH JUVENILE DIABETES MELLITUS AND NORMAL CHILDREN
U. Elgin, A. Batman, T. Simsek, B. Cankaya
Ulucanlar Eye Research Hospital, Ankara, Turkey

Purpose: To compare the optic disc topography parameters of cases with insulin-dependent diabetes mellitus and normal subjects in childhood, by using Heidelberg Retinal Tomograph (HRT II).

Material and methods: The topographic optic disc parameters (cup volume, cup area, rim volume, rim area, disc area, mean cup to disc ratio and mean cup depth) of 18 non-glaucomatous eyes of 18 children with type 1 diabetes mellitus and 18 eyes of 18 age-matched healthy children were compared with nonparametric Mann Whitney U test.

Results: No statistically significant differences were found between cup volume (p = 0.837), cup area (p = 0.776), rim volume (p = 0.937), rim area (p = 0.901), disc area (p = 0.437), mean cup to disc ratio (p = 0.763) and mean cup depth (p = 0.95).

Conclusion: This result suggests that, the non-glaucomatous eyes of children with type 1 diabetes mellitus and healthy subjects have similar topographic characteristics of the optic discs.

P191
EVALUATION OF THE OPTIC NERVE AFTER AACG USING VF, GDX, HRT & OCT IMAGING - A PRELIMINARY REPORT
D. Goh1, F. Ahmed1, H. Jayaratnam2, C. Migdal1
1 Western Eye Hospital, London, 2 Moorfields Eye Hospital, United Kingdom

Purpose: To evaluate the structural changes in the optic nerve and retinal nerve fibre layer in 20 eyes of 10 patients with symptomatic and asymptomatic angle closure in the post-acute phase following treatment/prophylaxis with argon laser peripheral laser iridotomies using HRT/ Gdx and Humphrey Visual field analysis.

Methods: Ethics approval and informed consent was obtained in 10 patients that presented to the Western eye hospital during 5 months. They were treated according to the hospital protocol. All eyes had laser iridotomies performed within 1 week of presentation. HRT, Gdx and Humphrey automated perimetry (HAP) data was obtained in all eyes between 1 to 3 months following treatment. Mean deviation (MD) for HAP, Rim Area (RA) & Cup shape (CS) for HRT and Nerve Fibre Index (NFI ) & Inter-Eye Symmetry (IES) for Gdx parameters were taken as the main measures of structural change.

Results: In group 1, 5 patients had symptomatic acute angle closure glaucoma (SAACG), and the contralateral eyes were used as controls. In group 2, 5 patients had asymptomatic angle closure again both eyes were imaged for comparison. Data from HRT, Gdx and visual fields were compared to assess for structural changes in the optic nerve head. HAP data showed no significant statistical difference between SAACG eyes compared with their contralateral eyes. No statistical difference was detectable between group 2 eyes. HAP data showed no statistical difference in RA and CS between contralateral eyes in both groups. In group 1 patients with symptomatic angle closure, CS was a more sensitive measure of structural change than RA, which showed probability values of p = 0.374, and p = 0.98 respectively.Gdx data showed no statistical difference in NFI in contralateral eyes in both group 1 and group 2 patients. In group 1 patients with symptomatic angle closure, NFI was a more sensitive measure of structural change than HRT parameters, which showed probability values of p = 0.145. In addition, Inter Eye Symmetry data showed that in 4 of 5 eyes the value reached statistical significance at the 95% level.

Conclusions: In comparing contralateral eyes with symptomatic angle closure glaucoma, the most sensitive tool for detecting structural changes is the Gdx nerve fibre analysis using NFI and IES data. CS was shown to be a more discerning measure than RA. HAP showed no discernable difference between the 2 eyes in both groups.
P192

FOURIER DOMAIN OCT IN GLAUCOMA AND SUSPECTS
T. Hannas
UFMG, Belo Horizonte, Brazil

We have examined patients with glaucoma and suspects. They have been submitted to full ophthalmological examination, including refraction, biomicroscopy, applanation tonometry, indirect binocular ophthalmoscopy and also to computerized visual field. The patients were also examined with Fourier Domain OCT. The most sensitive signal was the alteration of ISNT rule in early phases of the disease or in suspects. We expect the FD-OCT to progress and become a most common used tool for our glaucoma patients, which would be excellent because it is easy and fast to be done, despite expensive.

P193

CALCULATION OF GLAUCOMA DIAGNOSIS
J. Hornova
Dept. of Ophthalmology, 3rd Faculty of Medicine, Charles University, Prague, Czech Republic

Purpose: To evaluate testing parameters for initial glaucoma diagnosis.
Methods: This study included 74 eyes of healthy and cooperative patients between 19-63 years. Primary open glaucoma (POAG) has not been diagnosed till now at 20 eyes (Group 0), 32 eyes (Group 1) were indicated as a suspected POAG and at 22 eyes (GROUP 2) POAG were early diagnosed. Optic nerve head (ONH) was evaluated by Heidelberg Retina Tomograph II (HRT II); Moorfields global regression (MRA) classification (like 0-5) was used; c/d, rimA and mRNFL were also evaluated. Spaeth’s Disc Damage Likelihood Scale (DDLS) was used too. Intraocular pressure (IOP) was measured by Goldmann applanation tonometer, the initial average level of IOP was calculated. Visual field (VF) was tested by Humphrey Field Analyzer (HFA) perimeter (test 30-2) and Mean deviation (MD) and Pattern standard deviation (PSD) were calculated. All measured parameters were completely analyzed by S.T.A.R. (Scoring Tool for Assessing Risk).
Results: were evaluated using t-test.
Results: MRA of ONH does not show significant differences between Groups 0-1 and between Groups 1-2, both values c/d and rimA do not show any significant differences. The evaluation mRNFL shows differences between Groups 0-1 (p < 0.0001). DDLS classification shows differences between Groups 0-1 (p < 0.0002) and also between 1-2 (p < 0.02). Significant differences in initial IOP were between Group 0-1 (p < 0.0005) and 1-2 (p < 0.001). MD evaluation in the VF shows significant differences between Groups 0-1 (< 0.00001), but there is no difference between Group 1-2. On the contrary, evaluation PSD doesn’t show difference between Group 0-1, but the difference is between Group 1-2 (p < 0.01). The complete evaluation S.T.A.R. shows significant differences between Groups: 0-1 (p < 0.0002) and between 1-2 (p < 0.0001), as well.
Conclusions: Complete evaluation is necessary in early glaucoma diagnosis. Analysis S.T.A.R. is now as the most sensitive complex tool for early diagnosis POAG. DDLS classification of the ONH is very sophisticated and also very sensitive. The level of initial IOP remains important index in diagnosis of POAG.

P194

RELATIONSHIP BETWEEN FLICKER PERIMETRY AND HEIDELBERG RETINA TOMOGRAPH
D. Kourkoutas1, I. Apostolakis1, D. Kapralos1, G. Georgopoulos2, A. Fotopoulos2, N. Karamaounas1

Purpose: To investigate the relationship between Flicker perimetry and optic nerve head (ONH) stereometric measurements by Heidelberg Retina Tomograph 3 (HRT 3).
Methods: Sixty one eyes of primary open angle glaucoma (POAG) and ocular hypertension (OHT) patients were included in this cross sectional study. POAG patients were classified when they had abnormal visual field (VF) and/or ONH. OHT patients were classified when they had normal visual fields and ONHs and intraocular pressure (IOP) > 21 mmHg. Each patient underwent ONH imaging with HRT 3 (version 3.1). All the patients also underwent both standard automated perimetry (G1 program) and Flicker perimetry (G1 program, Dynamic Strategy), with the Octopus 301. All the global HRT parameters were used in the analysis. From the flicker perimetry printout mean defect (MD), mean sensitivity (MS) and loss variance (LV) were used. Relationship between HRT 3 parameters and Flicker perimetry indices was assessed by Pearson’s correlation.
Results: MS was associated (p < 0.01) with maximum cup depth, mean retinal nerve fiber layer (RNFL) thickness, RNFL cross sectional area and RB discriminant function value. A significant correlation (p < 0.01) was found between MD and certain HRT parameters (RNFL thickness, RNFL cross sectional area, RB discriminant function value, CLM temporal inferior). Additionally LV was highly associated (p < 0.01) with rim area, cup area, cup/disc area ratio, vertical cup/disc ratio, FSM discriminant function value and RB discriminant function value.
Conclusions: A significant correlation was found between HRT 3 stereometric measurements and Flicker perimetry indices. This structure function relationship might be useful in early detection and follow up of glaucoma.

P195

QUANTIFICATION OF RETINAL NERVE FIBRE LOSS WITH SPECTRAL DOMAIN OPTICAL COHERENCE TOMOGRAPHY AND SCANNING LASER POLARIMETRY
C. Mardin, F. Kruse, R. Laemmer, F. Horn, R. Tornow
1Department of Ophthalmology University Erlangen-Nürnberg, Germany

Purpose: To evaluate the feasibility of spectral domain coherence-OCT (SD-OCT) with Spectralis-HRA and OCT (Heidelberg Engineering, Heidelberg) to detect retinal nerve fibre (RNF) loss in glaucomas and to compare results with scanning laser polarimetry (SLP, GDx VCC, Zeiss Meditec).
Patients and methods: 37 healthy controls and 22 perimetric glaucoma patients (IOP > 21 mmHg, glaucomatous disc damage and visual field defects) were scanned using a commercially available SD-OCT and a SLP. With SD-OCT 20 consecutive B-scans were automatically averaged to reduce speckle noise. An online tracking system compensated for eye movements during data acquisition. Segmentation of retinal nerve fibre layer in 32 sectors was performed after export of 3.4 mm diameter circle scans (768 A-scans) centred on the optic disc. GDx VCC examination was performed in a standardized way. The double hump curves were plotted with both methods and correlated to each other. One eye of each patient was selected for statistic analysis.
Results: Compared to SLP SD-OCT showed in general higher RNF thickness values in normals and patients. In contrast to SD-OCT values for RNF thickness in the papillo-macular bundle of SLP were not different between normals and glaucoma eyes. SD-OCT showed a decrease of RNF measurements also in this temporal sector.
Conclusion: Spectral domain OCT seems to be a powerful tool to image and quantify RNFl layer in normals and glaucomas. Due to high resolution and the large number of A-scans even areas with very thin RNFl layers can be visualized. The increased relative retardance in glaucoma patients in the temporal region may be the reason, why at this location glaucoma patients do not reveal RNFl layer loss with SLP measurements although OCT technique showed significant RNFl layer thinning.

P196

RISK OF PROGRESSION AND SPECTRAL OPTICAL COHERENCE TOMOGRAPHY / ROP AND SOCT COPERNICUS

H. Peskova
Eye Office, Prague, Czech Republic

Purpose: To report the usefulness of spectral optical coherence tomography (SOCT Copernicus imaging to stage the glaucomatous damage.
Design: Observation case series.
Setting: Eye Office, Prague 8, Czech Republic.
Methods: Twenty eyes of ten patients with early to moderate glaucoma were included in this study. All patients showed good corrected visual acuity (VA20/20) and optimal IOP according to CCT under local medication. All subjects were measured using standard automated perimetry (program Glaucoma threshold, PTS) and imaged using spectral optical coherence tomography (SOCT Copernicus). Thickness of RNFL around the disc was determined with 7mm diameter circle SOCT scan and the pattern of neural retinal rim (NRrim) area was measured and analysed by Fourier coefficient.
Main outcome measures: Visualisation of loss of neuroretinal rim area by SOCT Copernicus.
Results: In accordance with ophthalmoscopic findings and visual field testing, imaging by SOCT Copernicus showed the loss of neural retinal rim volume(0.132-0.182 mm3).
Conclusions: Imaging is an important additional tool in diagnosis and the management of glaucoma. SOCT COPERNICUS allowed a noncontact cross-sectional imaging and provide accurate and subtle information about the shape and thickness of NRrim area. The further investigations are needed to elucidate potential advantages and disadvantages of this technique for detection of early to moderate glaucoma patients.

P197

THE STRUCTURE-FUNCTION RELATIONSHIP OF OCT AND HRT WITH THE MOORFIELDS MDT AND STANDARD AUTOMATED PERIMETRY

G. Verdon Roe1, M. Westcott1, R. Moosavi1, A.C. Viswanathan1, F. Fitzke2, D. Garway Heath1
1 Moorfields Eye Hospital, 2 Institute of Ophthalmology UCL, London, United Kingdom

Purpose: To explore the structure-function relationship of Optical Coherence Tomography (OCT) and Heidelberg Retina Tomography (HRT) with the Moorfields Motion Displacement Test (MDT) and Standard Automated Perimetry (SAP). The MDT is a test of hyperacuity. There are 32 line stimuli, each scaled by age and eccentricity and corresponding to a Humphrey 24-2 location.
Methods: One eye of 40 glaucoma patients (23 POAG; 12 NTG; 5 PDS. Age: mean 65, range 34 to 82 years) with abnormal HRT Moorfields Regression Analysis and reproducible SAP loss (Mean defect: mean -5.24; range -8.80 to 0.59 dB) underwent MDT, SITA Standard 24-2, HRT and OCT (Fast RNFL). Where the largest displacement at an MDT location was unseen, the threshold was recoded as 5 min arc above the largest displacement for that location. Where the smallest displacement was seen (“all seen”, the threshold was recoded as half the value of the smallest displacement. Structure-function relationships were assessed by linear regression of log HRT rim area or log OCT retinal nerve fibre layer thickness (RNFLT) (inferior and superior quadrants) with the log mean threshold of corresponding MDT and SAP locations (12 superior and 11 inferior locations according to Garway-Heath Map). For dB values the arithmetic mean was calculated.

Results: The MDT had a stronger association with the OCT RNFLT than HRT rim area, whilst the opposite was true for SAP (linear regression for the superior field versus inferior disc quadrant: (i) log MDT v log OCT: slope -0.589; R 0.219; P 0.002 (ii) log MDT v log HRT: slope 0.211; R 0.119; P 0.029 (iii) SAP dB v log OCT: slope 9.275; R 0.155; P 0.012 (iv) SAP dB v log HRT: slope 5.111; R 0.201; P 0.004). The associations for the inferior field/superior rim/RNFLT quadrant were consistently less strong than the superior field/inferior rim/RNFLT quadrant for both SAP and MDT.

Conclusions: The structure-function relationships of MDT and SAP are similar, with both SAP and MDT showing stronger regional relationship in the superior than the inferior field sector.

Poster Session 19

OTHER, BASIC SCIENCES

P198

METHOD DESCRIPTION FOR OBTAINING PRIMARY FIBROBLAST CULTURES FROM HUMAN TENON’S CAPSULE

K.N. Engin1, M.S. Kocabora2, S. Erdem Kuruca3, K. Akgün Dar4, Ö. Dayı Erol5
1 Bagcılar Education and Research Hospital, Department of Ophthalmology, 2 Vakıf Gureba Education and Research Hospital, Department of Ophthalmology, Istanbul University Istanbul Medical Faculty, 3 Department of Physiology, 4 Department of Molecular Biology and Genetics, Turkey

Purpose: Tenon’s capsule derived fibroblasts have been widely used in order to constitute in vitro models, especially for studies regarding ophthalmic surgery. Though they are quite difficult to produce primarily, no actual method in details could be found in literature. In this pro-study, we have aimed to obtain a productive procedure including biopsy localizations, reagents and culture conditions.
Methods: Explants of human Tenon’s capsule were obtained from seven patients at the time of PPV (Pars Plana Vitrectomy) surgery. From the scleral incision areas, 5 Tenon’s capsule and 2 Tenon’s capsule + conjunctiva tissues were taken from 3 and 2 patients respectively, whereas 2 juxtalimbal Tenon’s capsule tissue were taken from 3 and 2 patients respectively, whereas 2 juxtalimbal Tenon’s capsule tissues were taken from 3 and 2 patients respectively, all in the same dimensions. Various supplemented Dulbecco’s minimal essential medium (DMEM) is used in cell culture, maintained in a humidified 5% CO2 incubator at 37°C during 3-5 days. Existence and proliferation of fibroblasts are shown from the cultures. Individual variations were observed in their proliferative ability. The cross-sections were prepared from
**P199**

PRESERVATIVE-FREE TAFLUPROST, COMMERCIALLY AVAILABLE LATANOPROST, AND 0.02% BAK: AN EVALUATION OF THEIR OCULAR SURFACE TOXICITY IN RABBITS

H. Liang¹, F. Baudouin¹, A. Pauly¹, E. Brasni², J. Warnet¹, C. Baudouin²

¹ Department of Toxicology, Faculty of Biological and Pharmacological Sciences, ² INSERM, UMR S 872, Cordeliers Biomedical Institute, University Paris Descartes, Paris, France

Purpose: The preservative benzalkonium chloride (BAK) has demonstrated dose-dependent toxic effects on ocular surfaces. BAK-free prostaglandin analogues are under investigation for the treatment of glaucoma. The aim of this study was to evaluate the conjunctival and corneal reactions in rabbits of the preservative-free tafluprost, a new prostaglandin analogue.

Methods: Preservative-free tafluprost 0.0015%; a commercially available solution of latanoprost 0.005% containing 0.02% BAK; 0.02% BAK-alone; or phosphate-buffered saline (PBS) were administered to four groups of six male New Zealand albino rabbits 15 times at 5-minute intervals. Ocular surface effects were examined using in vivo confocal microscopy, flow cytometry on conjunctival impression cytology, and classical cytological and immunohistological methods.

Results: Clinical observation, using a slit lamp, revealed the highest toxicity for rabbits exposed to BAK-alone and latanoprost, whereas preservative-free tafluprost showed similar results to PBS. When using in vivo confocal microscopy, severe damage to the epithelium and marked inflammatory infiltration were observed with latanoprost and BAK-alone but normal structures were seen with preservative-free tafluprost and PBS. Flow cytometry showed a higher expression of CD45 and tumour necrosis factor receptor-1 with latanoprost or BAK-alone, compared with preservative-free tafluprost and PBS groups; latanoprost induced fewer positive cells when compared with BAK alone. Using crossection techniques, infiltration of CD45+ inflammatory cells and TUNEL+ apoptotic cells into the limbal and conjunctival areas was higher in latanoprost and BAK-alone treated eyes, compared with preservative-free tafluprost and PBS-treated eyes.

Conclusion: Rabbit corneconjunctival surfaces showed better tolerance when treated with preservative-free tafluprost compared with the commercially available latanoprost or 0.02% BAK alone.

**P200**

PRESERVED AND PRESERVATIVE-FREE TAFLUPROST RESULT IN COMPARABLE CORNEAL PENETRATION INTO RABBIT AQUEOUS HUMOR

P. Pellinen, J. Lokkila
Santer Oy, Tampere, Finland

Purpose: Some rabbit and human studies have suggested that high concentrations of the preservative benzalkonium chloride (BAK), used in antiglaucoma medications, may affect the corneal epithelium layer and thus increase the transcorneal penetration of poorly permeable drugs. However, contradictory studies have shown that BAK does not affect penetration. The aim of this study was to compare the corneal penetration in rabbit aqueous humor, of preserved and preservative-free tafluprost, a new prostaglandin analogue in development, following topical administration.

Methods: Forty-eight male New Zealand albino rabbits were divided into six groups of eight rabbits each. In each group, rabbits received a single topical dose of 30 µl preserved or preservative-free tafluprost 0.0015% eye drops, and tafluprost 0.0015% eye drops preserved with 0.01% BAK, administered into the right or left eye. Rabbits were euthanised at defined time points after the dose (45 minutes and 1.5, 2, 3, 6 and 8 hours). Concentrations of tafluprost acid (AFP-172) in rabbit aqueous humor were measured by using high performance liquid chromatography, coupled with single quad mass spectrometry with electrospray ionisation; pharmacokinetic parameters were calculated from the concentration data.

Results: The maximum concentration values after 45 minutes were 4.50 ng/ml and 3.99 ng/ml for preservative-free and preserved tafluprost formulations, respectively. The area under the concentration time curves (from 45 minutes to 3 hours) was 5.14 ng h/ml and 4.54 ng h/ml for preservative-free and preserved tafluprost formulations, respectively. Conclusion: After a single ocular instillation, preserved and preservative-free tafluprost result in comparable corneal penetration into rabbit aqueous humor. Thus, BAK does not affect the corneal penetration of tafluprost into the rabbit aqueous humor.

Note: This abstract was also submitted to the ARVO 2008 meeting.
Methods: Case-control study, controls matched for age and deterioration.

Conclusion: In this study sample, corneal hysteresis and corneal resistance factor were correlated with the severity of VF defects. Based on the PD MD trend analysis, corneal hysteresis could be correlated with the progression of glaucoma damage. These findings deserve further confirmation.

P202
INFLUENCE OF IOP ON CORNEAL VISCOELASTIC PROPERTIES
M. Ben M. Hamed, Y. Lteif, D. Gatinel, O. Abitbol, S. Doan, E. Gabison, M.H. Duong
Fondation Rothschild, Paris, France

Purpose: To investigate the influence of intraocular pressure (IOP) on the viscoelastic properties of the cornea. The Ocular Response Analyzer (ORA, Reichert Ophthalmic Instruments) is a new instrument to measure the viscoelastic properties of the cornea. The ORA measures the biomechanical response (Hysteresis, CH) to rapid indentation by a air jet. CH is the difference in applanation pressures between the rising and falling phase of the air jet.

Methods: Prospective study. Central corneal thickness was measured by Orbscan II device (Bausch & Lomb). ORA measurements and Goldmann applanation tonometry (GAT) were performed before and one hour after IOP lowering with apraclonidine instillation.

Results: Twenty eyes of 20 normal subjects were included. Mean age was 43 ± 12.3 years range 29-65. Mean central corneal thickness was 562 ± 23.7 µm range 520-600. Mean GAT IOP before and after apraclonidine drops were respectively 14.9 ± 3 mmHg, range 9-20, and 10.5 ± 2.8 mmHg, range 7-16. There was a statistical significant GAT IOP lowering after apraclonidine drops (p = 0.0003). Mean CH before and after apraclonidine drops were respectively 9.8 ± 1.3 mmHg, range 8.8 - 13.6, and 10 ± 1 mmHg, range 8.8 - 13.2. There was no statistical difference for CH measurement after IOP lowering (p = 0.60).

Conclusion: The viscoelastic properties of the cornea measured by the ORA is not influenced by IOP.

P203
SEARCH FOR BIOMARKERS IN GLAUCOMA:
SUSCEPTIBILITY OF PERIPHERAL LYMPHOCYTES TO OXIDATION AS A PREDICTOR FOR FASTER DETERIORATION OF VISUAL FIELD
S. Gandolfi1, P. Petronini2, N. Ungaro1, C. Sangermani1, M. Tardini1, G. Bacchi1
1 University Eye Clinic, Parma, Italy, 2 General Pathology, University of Parma, Parma, Italy

Purpose: To measure the apoptotic response to oxidative stress in peripheral lymphocytes of Open Angle Glaucomas on treatment, OH (on treatment and untreated) and age-matched controls and to correlate it with the rate of field deterioration.

Methods: Case-control study, controls matched for age and sex, data collected at recruitment and 5 years retrospectively, consecutive patients regularly followed at the Glaucoma Clinic of the University of Parma for at least 5 years prior to recruitment (cases) and consecutive patients referring to the Clinic for either refractive problems or mild ocular surface disease (controls). Exclusion criteria: (a) diabetes, (b) cardiovascular disease and systemic hypertension requiring treatment, (c) concurrent or previous malignancies, (d) blood dyscrasia / anemia, (e) present or past smoker status, (f) chronic alcohol abuse, (g) systemic infection within 6 months prior to blood withdrawal, (h) autoimmune disorders ; (1) Patients’ screened for eligibility (outpatient Clinic and Glaucoma Clinic) n = 468 cases (374 OAG and 123 OH); 58 OAG, 41 OH untreated and 38 OH treated eligible (2) Enrolment visit: (a) visual acuity LogMAR, (b) VF 24/2 SITA, (c) HRT MRA, (d) IOP GAT, (e) CCT, (f) blood sampling (3) Data collected from each patient’s records (cases) up to 5 years prior to enrolment: (a) VFs, (b) VA, (c) IOPs, (d) changes of therapy (4) processing of blood. Blood testing: (a) incubation of Lymphocytes with increasing concentrations of hydrogen peroxide (up to 100 microM) for 2 hours (b) apoptosis tested by DNA fragmenta-
tion test (ELISA with Ab anti Histone / DNA, absorbance read at 405 nm). Field analysis: trend analysis, MD vs. time. Results: the basal apoptotic index was 0.132 ± 0.04 (controls), 0.128 ± 0.052 (OH untreated), 0.139 ± 0.074 (OH treated), 0.214 ± 0.08 (OAGs, p < 0.01 vs. both OHs and controls). Upon exposure to 10 microM hydrogen peroxide, the index increased by 16-18% in controls and OHs, and by 86% in glaucomas (p < 0.001). The progression rate proved 0.35 + 0.18 dB / yr and was not correlated neither with the mean IOPs, nor with MD. The progression rate was moderate-
ly correlated with the basal apoptotic index (r2 = 0.286), and more strongly correlated with the % increase of apoptotic index upon exposure to peroxide (r2 = 0.746).

Conclusions: Measuring the lymphocytes’ reactivity to perox-
ide may help in dissecting OAG patients at a higher risk for faster VF deterioration.

P204
ATROPHY OF THE LATERAL GENICULATE NUCLEUS IN HUMAN GLAUCOMA BY MAGNETIC RESONANCE IMAGING
N. Gupta1, G. Greenberg2, L. Noël de Tilly3, B. Gray2, M. Polemidiotis2, Y. Yücel1
1 Dept of Ophthalmology & Visual Sciences, Laboratory Medicine & Pathobiology, University of Toronto, 2 Division of Neuroradiology, Dept of Diagnostic Imaging, St. Michael’s Hospital, University of Toronto, Canada

Aim: To determine in vivo whether the LGN undergoes atrophy in patients with glaucoma and vision loss compared to normal subjects.

Methods: Following institutional St. Michael’s Hospital Research Ethics Board approval, a prospective and masked neuroimaging study was conducted on glaucoma patients with Humphrey 24-2 visual field defects affecting both eyes (n = 10) and age-matched controls (n = 8) with normal visual fields. Following informed consent, all subjects underwent 1.5 Tesla magnetic resonance imaging (MRI). Coronal proton density magnetic resonance images of both LGNs were ob-
tained and LGN height measurements were measured by consen-
sus by 3 neuroradiologists masked to the diagnosis. Glaucoma and control groups were compared using t-test.

Results: Mean age of glaucoma and control groups was 63.1 ± 7.7 years (± SD) and 58.6 ± 10.0 years respectively, and this was not statistically different, p > 0.05. In the glaucoma group, visual fields showed OD and OS mean deviations of -12.63 ± 4.18 dB and -15.76 ± 4.30 dB respectively, and the difference between eyes was not significant, p > 0.05. In the
glaucoma group, mean cup/disc ratio was 0.8 compared to 0.4 in control subjects and this difference was statistically significant, p < 0.001. Both LGNs were identified and visualized by 1.5 Tesla MRI for every subject. Combined LGN height in glaucoma was significantly decreased compared to controls (8.07 ± 1.06 mm vs. 9.56 ± 0.86 mm; p = 0.005).

Conclusion: In vivo MRI evidence of LGN degeneration in human glaucoma is consistent with ex vivo primate and human neuropathological studies. This finding may be relevant to understanding visual system injury and/or progression in some glaucoma patients.

Abbreviations: LGN (lateral geniculate nucleus), MRI (magnetic resonance imaging).

Funded by the Clinical Research Council of Canada.

P205
PERSONALITY TRAITS ASSOCIATED WITH COMPLIANCE OF PATIENTS ON ANTI-GLAUCOMA MEDICATION

G.J. Seong, S. Hong, S.Y. Kang, C.Y. Kim
Institute of Vision Research, Department of Ophthalmology, Yonsei University College of Medicine, Seoul, Korea

Purpose: To assess patient attitudes towards anti-glaucoma medication and their association with compliance, visual quality of life, and personality traits.

Method: Prospective cross-sectional comparative case series. One hundred twenty-five confirmed glaucoma patients were enrolled and divided into "pharmacophobic" and "pharmacophilic" groups according to their scores on the Modified Glaucoma Drug Attitude Inventory (MG-DAI). To establish a correlation with patient drug attitude, each group had their subjective drug compliance, visual quality of life, and personality traits examined. For visual quality of life, a modified version of the NEIVFQ-25 written for Koreans was utilized. For personality traits, the Myers-Briggs Type Indicator (MBTI) was used to sub-classify each group.

Results: Among the patients analyzed, 91 (72.80%) patients showed a "pharmacophobic" attitude and 34 (27.20%) patients showed a "pharmacophilic" attitude to anti-glaucoma medications. The pharmacophobic group tended to have worse compliance than the pharmacophilic group. Personality dichotomies from the MBTI also showed different patterns for each group. However, there was no subscale that sharply distinguished the two groups in the Modified NEIVFQ-25 for Koreans.

Conclusions: In glaucoma patients, pharmacological compliance was influenced by a patient’s attitude towards drugs. In addition, an association might exist between drug attitude and the glaucoma patient’s underlying personality traits.

P206
THYROID DISEASE - A FACTOR ASSOCIATED WITH OCULAR HYPERTENSION AND PRIMARY OPEN-ANGLE GLAUCOMA

M. Konareva-Kostianeva, V. Marinov
Dept Ophthalmology, Medical University, Plovdiv, Bulgaria

Purpose: To determine if thyroid disease is associated with increased risk of ocular hypertension and primary open-angle glaucoma using a large cohort of patients.

Design: The study is conducted in a case-control fashion.

Methods: Four hundred and forty consecutive patients with ocular hypertension (OH) and primary open-angle glaucoma (POAG) are evaluated by self-reported history of previous and existing thyroid disease. Blood levels of thyroid-stimulating hormone (TSH) and free T4 are examined when is necessary. A group of 440 nonglaucoma patients from the eye clinic are evaluated in the same manner. The control subjects are matched according to age and gender.

Results: Thyroid disease is revealed in 36 patients with OH and POAG (3 males and 33 females, age range 28 - 85 years) (8.18%) and in 16 patients (2 males and 14 females, age range 46 - 79 years) of the control group (3.63%). The patients with OH and POAG are significantly more likely to have thyroid disease than controls: Odds ratio = 2.36, 95% CI. In the both groups the hypothyroid patients are more than hyperthyroid patients: 28 - in the research group and 14 - in the control group. Although some patients have a past medical history of thyrotoxicosis or hypothyroidism, OH and glaucoma are available in the absence of systemic or biochemical abnormalities.

Conclusions: Our study has demonstrated a significantly greater risk of subjects with a thyroid disease developing OH and glaucoma, compared with controls.

P207
HOW DOES IOP CHANGE DURING WIND INSTRUMENT PLAYING?

K. Kappmeyer, K. Kotliar, I. Lanzl
Augenklinik der TU, Munich, Germany

Background: Intraocular pressure may rise following Valsalva manoeuvres. When playing wind instruments a Valsalva manoeuvre is performed by the musician. Whether IOP rises during and after high and low resistance wind instrument performance was examined.

Material and methods: In 29 musicians of lay orchestras and 7 musicians of a professional orchestra IOP was assessed by rebound tonometry. IOP measurements were obtained before and during 2 minute playing intervals and immediately after cessation of instrument performance for two more minutes. The instruments used included high resistance instruments (such as bassoons) and low resistance instruments (such as trombones). Peak flow measurements were additionally performed in order to assess maximal air flow capacity.

Results: In high resistance wind instruments a mean increase in IOP of 9.2 mmHg compared to baseline could be observed during playing. The maximal IOP measured was 42 mmHg in a male lay player during playing a high pitched loud piece on the trumpet. One minute after cessation of instrument use a mean decrease in IOP of 1.2 mmHg could be observed compared to baseline.

Discussion: High resistance wind instrument playing can considerably increase the musician’s IOP. This is especially the case in high pitched and loud passages of the musical piece. Wind instrument players therefore undergo remarkable changes in their IOP during their performance. IOP pressure changes are considered to be a risk factor for glaucomatous optic nerve damage. We therefore recommend that high resistance wind instrument players should be carefully monitored in their visual function by an ophthalmologist.

P208
GLAUCOMATOUS VISUAL FIELD CHANGE AFTER REFRACTIVE SURGERY

S.H. Lee, J.B. Lee, S.J. Oh
Yonsei Plus Eye Center, Seoul, Korea

Purpose: To evaluate the clinical characteristics of glaucoma patients after custom phakic intraocular lens implantation and laser epithelial keratomileusis (LASEK).

Methods: Seventeen myopic eyes of 12 patients were included in the study. Pupil size was measured under photopic and scotopic conditions, and postoperative intraocular pressure, refractive error, visual acuity and endothelial cell count were
P209
A SURVEY OF PRIMARY OPEN ANGLE GLAUCOMA (POAG) CASE FINDING STRATEGIES USED BY COMMUNITY OPTOMETRISTS IN THE UK
J. Myint1, D. Edgar1, A. Kotecha2, I. Murdoch3, J. Lawrenson1
1 Henry Wellcome Laboratories for Visual Science, City University, London, 2 NIH Biomedical Research Unit, Moorfields Eye Hospital and Institute of Ophthalmology, London, 3 Glaucoma Unit, Moorfields Eye Hospital, London, United Kingdom

Purpose: In the UK, most POAG suspects (> 90%) are identified by community optometrists based on opportunistic screening of individuals attending for an eye examination. In the absence of a formal screening programme, the decisions regarding who should be investigated for glaucoma, and what investigations are required, are at the discretion of the optometrist. The optometric professional body, the College of Optometrists (UK), has published guidance for its members, which recommends three tests to detect POAG: assessment of the optic nerve head, tonometry and assessment of central visual fields. However, there is the potential for wide variation in case finding strategies and criteria for referral across the profession. The aim of this study is to carry out a survey of UK community optometrists to determine current practice in relation to the detection and referral of POAG.

Methods: UK optometrists were recruited via email to take part in a purpose written online survey. The survey questions covered the following areas; use of screening instruments, mode of practise, strategies for POAG detection and procedures for POAG referral. The preliminary analysis looked at the proportion of responses to categorical outcome measures.

Results: Preliminary analysis of the survey responses elicited that the majority of optometrists (approx. 80%) completed the triad of tests recommended in the College of Optometrists guidance, which would then be recorded in any subsequent referral letter. Almost 98% of practices were equipped with all the relevant instrumentation for glaucoma detection (typically, non-contact tonometer (80% of practices), field screener and a means of imaging the optic disc). Over 60% of optometrists had not completed any further training since registration related to glaucoma, with less than 10% of practices participating in any shared care/co-management/triage schemes with an ophthalmologist. This was corroborated by over 90% of POAG referrals still being made via the patient’s General Medical Practitioner.

Conclusion: The results of the survey demonstrate that UK optometrists are well equipped to screen for POAG and are performing the tests recommended by their professional body in patients presenting for a routine eye examination. A greater public awareness of the optometrist’s role as a screener may lead to improved POAG detection.

The authors would like to acknowledge Pfizer UK Ltd for the unrestricted grant in support of this research.

P210
GLAUCOMA MANAGEMENT SYSTEM® 2ND EDITION: SOFTWARE FREE OF CHARGE USEFUL IN RECORD KEEPING AND MANAGING PATIENTS
D. Paoli1, C.E. Traverso1, F. Pasutto2, M. Zeppieri3, P. Brusini1
1 Department of Ophthalmology, Hospital of Monfalcone, Italy, 2 Department of Ophthalmology, University of Genoa, Italy, 3 Humangenetisches Institut Universitätshklinikum Erlangen, Germany, 4 S.M.Miserendino Hospital, Department of Ophthalmology, Udine, Italy

Purpose: The Glaucoma Management System (GMS) is a new interactive database free of charge, which provides ophthalmologist with a computer-based clinical and history record keeping system for patients. Visual field damage and information regarding the anatomic optic disc and retinal nerve fiber layer appearance are classified, thus providing relatively standardized and objective methods that can aid in patient management over time and in communicating patient information with colleagues. This user-friendly program can currently run in Italian and English; translation in other languages is possible using a multilingual model. A copy of the software is available free of charge upon request.

Methods: The GMS database was created using MS (Microsoft) Access. The software permits easy access to records and provides clinical charts according to EGS guidelines that can be modified, stored and printed. The program provides a classification of visual field results according to Brusini’s GSS 2. Moreover, risk factors and functional and structural damage can be thoroughly assessed on a patient-to-patient basis to help determine the right target IOP and treatment for each specific patient.

Results: The advantages of the GMS patient database are numerous, which include:
- Quick way to monitor the number of patient check-ups and program future visits.
- Excellent diagnostic tool to record valuable information regarding medication, including: posology, costs, effectiveness and adverse effects.
- Standardization of optic disc appearance information.
- Staging visual field damage and monitoring change over time.
- Possibility of exchanging and comparing data with other centers that use the same software.
- Equipped with a simple or complex.

P211
THE RESULT OF CATARACT SURGERY IN THE PATIENTS WITH ADVANCED GLAUCOMA AND CATARACT
J.W. Park1, K.S. Lee1, C.Y. Kim2
1 National Health Insurance Corporation Ilsan Hospital, 2 Yonsei University of Medical Center, Korea

Purpose: To study the effect of phacoemulsification and intraocular lens implantation on the advanced glaucoma in the patients with advanced cataract and glaucoma.

Methods: This prospective study included 33 eyes(33 patients) with cataract and advanced glaucoma with a cup-disc ratio (CD) of 0.8-1.0 and marked visual field defects with partially preserved central function. They underwent phacoemulsification and intraocular lens implantation performed by one surgeon. None of the patients had prior intraocular surgery. In all patients cataract Surgery was performed by clear corneal incision with topical anaesthesia. Preoperatively, at the first postoperative day, and after 1, 3, 6 months, the visual acuity (V), the intraocular pressure (IOP), the number of antiglaucomatous drugs and the visual fields were assessed.

Results: The mean preoperative IOP was 15.30 ± 5.36 mmHg with a mean of 2.01 glaucoma medications. The mean postop-
P212
LEKSELL GAMA KNIFE IN THE TREATMENT OF PRIMARY OPEN ANGLE GLAUCOMA A CASE REPORT
S. Sicakova1, P. Vyborny1, V. Vladyka2
1 Eye Department, 1st Faculty of Medicine and Central Military Hospital, Prague, Czech Republic, 2 Department of Stereotactic and Radiation Neurosurgery, Na Homolce Hospital, Prague, Czech Republic

Purpose: Primary glaucoma is considered to be one of the most serious eye diseases. There is a general effort to develop new therapeutic techniques. According to our good experience with irradiation of ciliary body in cases of secondary glaucomas by Leksell Gama Knife Surgery (LGKS) we are now focusing our attention to primary glaucoma treatment by this technique.

Method: Patient, female, 63-years-old, underwent glaucoma treatment for 9 years. Medication started by beta-blockers (0.5% Timolol) at intraocular pressure (IOP) 30 mmHg. Her visual acuity was 1.0 ± 0.75D, C/D ratios 0.3. No apparent glaucoma changes were approved by laser scan exams. After the treatment, IOP decreased on acceptable level. Still, the chronic conjunctivitis and irregularities of tarsal conjunctiva of upper lid because of allergy dominated in the clinical picture. Even after medication was changed (gradually Betoptic S, Xalatan, Travatan, Vistagan) the situation did not improve. Patient did not agree with further laser and/or surgical procedure.

Results: In spite of the fact the patient stood badly the local medication for many years, we were not allowed to carry out any of the conventional procedures. In the end, we indicated ciliary body irradiation treatment by Leksell Gama Knife (Elekta Instruments AB). Procedure was carried out according to the irradiation protocol described before (J Neurosurg 102: 214-219, 2005), glaucoma medication was stopped. Visual functions have been stable.

Conclusion: By irradiation of ciliary body by the LGKS the compensation of IOP was reached and besides it was possible to fully stop glaucoma medication which was hardly tolerable. In appropriately identified case we consider the LGKS to be a significant instrument that improves quality of life in glaucoma.

P213
MANAGEMENT OF CONGENITAL GLAUCOMA ASSOCIATED TO NEUROFIBROMATOSIS TYPE 1
E. Gutiérrez-Diaz, T. Colás-Tomás, P. Tejada-Palacios, A. Barceló-Mendiguchia, E. Mencía-Gutiérrez
Hospital Universitario 12 de Octubre, Madrid, Spain

Aims: Most frequent ophthalmic associated lesions in neurofibromatosis type 1 include iris Lisch nodules, optic nerve gliomas, and neurofibromas located on the eyelid, conjunctiva, or orbit. Glaucoma is much less frequent, and it may be difficult to treat. We present two patients with neurofibromatosis type 1 and associated unilateral congenital glaucoma.

Case Report: In case 1, the glaucoma was the first symptom of the disease, and it was present at birth. It was surgically treated by means of an Ahmed glaucoma valve implantation, and IOP has been well controlled after 13 months of follow-up. In case 2, the glaucoma appeared at 5 months of age, and a trabeculectomy was initially performed, but at 2 years of age, it failed and an Ahmed glaucoma valve was implanted, with adequate IOP control after 7 years of follow-up. Both children were males, and in both cases there were orbital neurofibromas and a dysplasia of the greater wing of the sphenoid of the same side. In case 2, orbital enlargement surgery was also performed at 4 years of age.

Conclusion: Congenital glaucoma management in the context of neurofibromatosis is very complex, due to the frequent association of orbital and eyelid tumors and bone dysplasia, and its prognosis is usually poor. We present 2 cases in which good control of IOP has been achieved with Ahmed glaucoma valve implantation after 13 months and 7 years of follow-up.

P214
A COMPARISON OF INTRAOCULAR PRESSURES AFTER KETAMINE AND SEVOFLURANE IN CHILDREN WITH GLAUCOMA UNDERGOING EXAMINATION UNDER ANAESTHESIA
L. Jones1, G. Lascaratos1, H. Nagi1, V. Sung1, R. Holder2
1 Birmingham and Midland Eye Centre, City Hospital, 2 University of Birmingham, Birmingham, United Kingdom

Purpose: For accurate intraocular pressure (IOP) measurement in young children, examination under anaesthesia may be necessary. Most anaesthetics used for examination under anaesthesia (EUA) have some effect on intraocular pressure. We conducted a retrospective study to assess the IOP changes when paediatric glaucoma patients converted from ketamine to sevoflurane anaesthesia during EUAs.

Methods: Consecutive patients with definite or suspected paediatric glaucoma who were uncooperative for reliable IOP measurement in clinic and required EUA were included in the study. Our routine practice is to measure IOPs after an intramuscular injection of ketamine (5 mg/kg), using a Perkins applanation tonometer. Three measurements are taken from both eyes. Sevoflurane would then be given as the maintenance anaesthetic with a laryngeal mask airway for the surgical procedure. The IOPs are then rechecked after sevoflurane as above. Mean IOPs were used for analysis. Paired t-test was used to assess the difference between the IOPs for ketamine and sevoflurane for the whole group and on three subgroups (ketamine IOP < 20 mmHg, 20 mmHg – 30 mmHg, > 30 mmHg). One-way ANOVA test was used to assess the difference between groups.

Results: A total of 70 data-points were available and used for the analysis. The mean IOP for sevoflurane (17 ± 10 mmHg) was statistically lower than for ketamine (24.4 ± 12.7 mmHg, p < 0.001). The percentage reduction was 28.5 ± 20.8% (95% CI; 23.5, 33.4). The percentage reduction between the subgroups was not statistically significant (p= 0.192).

Conclusion: Sevoflurane lowers IOPs more than ketamine. The percentage of reduction is independent of the initial (ketamine) IOP.
Secondary Glaucoma Following Paediatric Cataract Surgery in Victoria Australia

J. Ruddle1, S. Staffieri2, J. Crowston2, S. Rogers2, D. Mackey1
1 Royal Victorian Eye and Ear Hospital, Melbourne, Australia,
2 Centre for Eye Research Australia, East Melbourne, Australia

Purpose: To determine the prevalence and risk factors for secondary glaucoma following cataract surgery in an Australian patient population.

Methods: A retrospective review was performed of paediatric (< 18 yo) patients undergoing lens surgery (Jan 1992 - May 2006) at the Royal Children's Hospital and Royal Victorian Eye and Ear Hospital in Melbourne. The major outcome was diagnosis of secondary glaucoma defined by clinician decision to treat IOP. Risk factors assessed included age at surgery, associated ocular and systemic conditions, family history and primary IOL implantation. Analysis included Kaplan Meier survival curves. Where available the most recent visual outcome of all eyes was recorded.

Results: Excluding patients undergoing surgery due to trauma, uveitis, aniridia, ROP and lens subluxation there were 236 patients who underwent cataract surgery. 194 patients and 490 eyes had follow-up of greater than 6mths (range 6 mths to 15.2 years) with median follow-up of 5.9 years. The average age at diagnosis of aphakic glaucoma was 6.7 years. Glaucoma developed in 12 (13.1%) eyes of 12 (12.4%) patients. Median age at surgery in those with glaucoma was 101 days compared to those who did not develop glaucoma of 601 days (p < .0001). No patients with IOL implantation developed glaucoma and there was no increased risk of developing glaucoma with persistent hyperopic primary anisometropia or any other adverse factor compared to those without. Glaucoma occurred in 9 out of 63 patients with persistent hyperopic anisometropia but in none of those with a family history of cataract. 39% (15 of 38) eyes with glaucoma had best corrected vision worse than 6/60 compared to 18% (42 of 235) of eyes without glaucoma (p < .05).

Conclusions: Secondary glaucoma is a sight-threatening disease associated with paediatric cataract surgery. Long term surveillance of these patients is vital. Younger surgery age is a significant risk factor. The difference in glaucoma rates with and without IOL implantation likely reflect the age at which the surgery was performed and the complexity of the surgery.

A Short Scleral Tunnel Combined with Tube Covering by Tenon to Prevent Postoperative Tube Exposure Following Ahmed Glaucoma Valve Implantation in Congenital Glaucoma

N. Tuncelik, A. Sarici, A. Ozkok
Istanbul University Cerrahpasa Medical Faculty, Turkey

Purpose: To evaluate the results of a novel technique, tube insertion into a short scleral tunnel combined with tube covering by tenon, for preventing postoperative tube erosion through the conjunctiva following Ahmed Glaucoma Valve implantation in congenital glaucoma.

Methods: 60 eyes of 60 patients diagnosed congenital glaucoma and have failed conventional angle surgery included in this study. 32 patients underwent traditional Ahmed Glaucoma Valve implantation surgery, 28 patients underwent Ahmed Glaucoma Valve implantation surgery with new technique.

Results: With traditional technique, conjunctival erosions occurred in 3 eyes of 32 patients (9.3%) after a median follow-up of 29 months (range 18-50 months); no conjunctival complications were occurred in patients who underwent surgery using the new technique during a median follow-up of 32 months (range 22-46 months). (p = 0.021, chi-square test).

Conclusions: Inserting the tube into a short scleral tunnel combined with tube covering by tenon prevents tube exposure through the conjunctiva in eyes with Ahmed Valve implants in congenital glaucoma.

Trained Artificial Neural Network in Assessment of Visual Fields for Glaucoma, as Good as Subjective Judgment?

S. Andersson, D. Bizios, A. Heijl, B. Bengtsson
Department of Clinical Sciences, Ophthalmology, Lund University, Malmö University Hospital, Sweden

Purpose: To compare the performance of an artificial neural network (ANN) trained to recognize glaucomatous visual field defects with that performed subjectively by ophthalmologists with different experience of visual field interpretation.

Methods: Eighteen ophthalmologists graded visual field Statpac Single Field Analysis printouts (Humphrey Field Analyzer, 30-2 SITA Standard) of glaucoma patients and healthy subjects. The glaucoma patients were randomly selected from the perimeter's hard disc. The definition of glaucoma was based on optic disc evaluation and not on visual field appearance. Only glaucoma patients with relatively mild field loss, defined by a Mean Deviation ≤ -10 dB, were included. Normal fields were retrieved from a large database of healthy subjects living in Malmö. Each ophthalmologist was assigned to one of three groups: 1. glaucoma specialists, 2. general ophthalmologists, and 3. ophthalmologists with other subspecialty or residents. The subjective gradings were performed independently and in a masked fashion. Sensitivity and specificity were calculated.

Results: Visual fields from 99 glaucoma patients and 66 age-matched healthy subjects were included. Average sensitivity and specificity for the ANN was 93% and 91% respectively. The corresponding values for the glaucoma specialists were 90% (87-93%) and 91% (90-92%), for general ophthalmologists 88% (81-95%) and 87% (59-94%) and for the less experienced group 85% (76-96%) and 91% (77-97%).

Conclusion: The sensitivity of the ANN was non-significantly better than the results of the glaucoma specialists, while the specificity was the same. Most ophthalmologists performed well and had satisfactory sensitivity and specificity.

Analysis of Total Deviation in Patients with Early Glaucoma

Y.S. Chung, S.I. Kwon, J.W. Seo
Hallym University Medical College, Dept of Ophthalmology, Hallym University Sacred Heart Hospital, Korea

Purpose: To analyze the results of total deviation (TD) measured by standard automated perimetry in patients with early (preperimetric) glaucoma.

Methods: Fifty seven patients with early glaucoma who have retinal nerve fiber layer (RNFL) defect in red free photograph but normal standard automated perimetry in patients with early (preperimetric) glaucoma. Sixty one normal controls were enrolled. TD plot in Humphrey visual field was divided into six sectors according to the optic disc-VF mapping (Garway-Heath, Ophthalmology 2000) and compared the mean threshold of
each sector between early glaucoma and control. Subjects in each group were classified into normal TD group and abnormal TD group by the presence of visual field defect in TD plot, and the proportions of the TD abnormality were calculated. Finally, peripapillary RNFL thickness was measured using Stratus optical coherence tomography (OCT) and compared between normal TD group and abnormal TD group of early glaucoma patients.

Results: Compared with controls, mean TD thresholds of early glaucoma were significantly low in inferonasal, inferotemporal, superonasal sectors (p < 0.05). TD abnormalities were found in 25 out of 57 glaucoma eyes (43.86%); 20 out of 52 eyes (38.50%) when excluding 5 eyes whose TD abnormal points did not correspond to RNFL defect, while 4 out of 61 eyes showed TD abnormality in controls (6.58%). In early glaucoma, RNFL thickness was significantly lower in abnormal TD group (25 eyes) than normal TD group (32 eyes) at eleven o’clock (p = 0.037, 112.60 ± 19.49 µm, 126.53 ± 27.72 µm, respectively).

Conclusions: In patients with early glaucoma of preperimetric stage, 38.50% have glaucomatous VF defect in TD plot and RNFL thickness was significantly low in TD abnormal glaucoma eyes. So the importance of TD plot should be considered in practice. It is necessary to study about the ability of TD plot to predict the development of definite VF defect in patients with preperimetric glaucoma.

This abstract was submitted to the 2008 ARVO meeting.

P219
GLAUCOMA PROGRESSION ANALYSIS (GPA) SOFTWARE VERSUS CLINICAL CRITERIA ANALYSIS
F.J. Muñoz-negrete1, F. Arnalich-Montiel2, P. Casas-Llera1, F. Rebolleda1
1 Hospital Ramón y Cajal, Ophthalmology Department, University of Alcalá, Madrid, Spain, 2 Moorfields Eye Hospital, London, United Kingdom

Purpose: To test the performance of the Glaucoma Progression Analysis (GPA) software in the Humphrey Field Analyzer in ruling out glaucomatous progressive visual field loss in routine ophthalmic clinical practice.

Methods: Retrospective cross-sectional study. One hundred and twenty-nine eyes of 99 patients with glaucoma with at least five reliable visual fields were included. Patients had an average follow-up of 5 years.

Intervention: All participants had undergone previous comprehensive ocular examinations, including automated perimetry. The progression of the visual field damage was analyzed by an independent observer using GPA and defined clinical criteria.

Main Outcome Measures: The prevalence of progressive visual field damage was determined by clinical criteria analysis and GPA analysis. Agreement between both methods of progression analysis was quantified by kappa analysis. The GPA performance also was calculated when considering clinical criteria analysis as the gold standard.

Results: The prevalence of progressive visual field damage was 28% with GPA analysis and 27% with clinical criteria analysis. The kappa index of agreement between these two approaches was 0.83 if two consecutive visual fields with progressing damage were needed to confirm true progression. If three consecutive visual fields with progressing damage were needed to confirm progression, agreement decreased to 0.58. The GPA performance showed a sensitivity and specificity of 89% and 95%; respectively, and a positive likelihood ratio of 17 if based on the criterion requiring two consecutive visual fields with progressing damage. The performance was poorer if based on the criterion requiring three consecutive visual fields with progressing damage.

Conclusions: GPA identification of progression of visual field damage is highly correlated with a thorough clinical assessment of the visual fields and could be used routinely in normal clinical practice to screen for progressing glaucoma damage with high specificity, a very strong positive likelihood ratio, and good sensitivity and negative likelihood ratio.

P220
VISUAL FIELD TEST FREQUENCY IN GLAUCOMA MANAGEMENT
J. Norris1, P. Brogden1, P. Galloway2
1 St James’s Hospital, Leeds, United Kingdom, 2 St James’s Hospital, Leeds, United Kingdom

Purpose: To assess the frequency of automated visual field tests in glaucoma management and to compare field rates depending on: severity of field loss, presence of glaucoma progression and glaucoma diagnostic subtype.

Methods: Consecutive Humphrey 24-2 visual field tests performed between July 1992 and April 2007 in a University Teaching Hospital were audited. Only data for patients who had undergone 3 or more field tests was studied. A record was made of the total number of field tests per eye, the field test rate, the mean deviation (MD) of both the presenting field test and the final field test. The European Glaucoma Society (EGS) progression score for each eye was calculated and the field test rate for progressing and non-progressing patients was compared. A sub-group of patients had glaucoma diagnoses recorded with the Medisoft electronic patient record. The field rate for each glaucoma subtype was compared.

Results: 34225 Humphrey visual field tests of 5888 eyes of 3133 patients were analysed. The mean number of field tests per eye was 5.6 (3-19, SD 2.8). The mean test rate was 1.34 per year = one field every 8.9 months. The mean follow up period from the date of the 1st test was 5.1 years/patient (0.5-14.6 SD 3.1). 492 eyes with advanced field loss (MD < -15dB) on presentation had 1.31 fields per year (fpy) and 2888 eyes with mild field loss (MD 0 to -5 dB) 1.30 fpy (p = 0.258 student’s t-test). 89 (20.8%) eyes had confirmed EGS progression and a field rate of 1.27 fpy. 339 (79.2%) eyes had no field progression using EGS criteria and a rate of 1.26 fpy (p = 0.753). POAG eyes had a mean of 1.28 fpy (p = 0.784), NTG 1.46 fpy (p = 0.481), and OHT 1.18 fpy (p = 0.09). According to EGS criteria 29% of POAG, 22.7% of GS, 28.5% of NTG and 2.6% of OHT eyes showed progression.

Conclusion: Visual field test frequency does not significantly differ in eyes presenting with mild or severe field loss, nor between eyes which show field progression or stability according to EGS criteria. Field rates do not differ in GS, NTG or OHT eyes when compared to POAG eyes. Batch analysis of visual field test scores using an electronic patient record in the context of glaucoma management can assist in determining the demand for perimetry by glaucoma diagnostic subtype and assist in resource planning.

P221
FIRST RESULTS WITH THE SITA-SWAP PROGRAM IN FINDING EARLY GLAUCOMA VISUAL FIELD DAMAGE
C. Vidinova MD, PH.D. Bulgaria

Aim: The aim of our survey is to point out our first results requiring three consecutive visual fields with progressing damage.
with the SITA-SWAP program of the Humphrey automated perimeter, in detecting the earliest visual field defects in glaucoma suspects. To reveal the advantages of this type of perimeter over the standard automated perimeter (SAP).

Material and methods: We enrolled 7 patients with ocular hypertension (IOP > 21 mmHg; optic disc, RNFL appear- coma suspects. To reveal the advantages of this type of perimeter, in detecting the earliest visual field defects in glau-

The mean (SD) MD slope was -0.36 (0.58) dB/yr for OD and -0.21 (0.51) dB/yr for OS. According to GPA, 45 right eyes and 36 left eyes in 75 patients showed at least possible progression at the end of the follow-up. According to NPA, 69 right eyes and 67 left eyes in 109 pa-
tients showed at least possible progression. Thirty-two right eyes and 31 left eyes showed progression on both GPA and NPA. In eyes with progression detected by NPA only, baseline MD was worse and more baseline tests were out of range ac-
cording to GPA than in eyes with progression detected by GPA (regardless of NPA).

Conclusion: GPA labeled fewer eyes as having progression than did NPA. In early glaucoma, agreement appeared to be fairly good; in the more advanced stages NPA seems to be more sensitive to change.

P222

A PROSPECTIVE COMPARISON OF PERIMETRIC PROGRESSION DETECTION ALGORITHMS IN THE GRONINGEN LONGITUDINAL GLAUCOMA STUDY: THE EMGT ALGORITHM VERSUS A NON-PARAMETRIC ANALYSIS BASED ON MEAN DEVIATION

C. Wesselink, G. Heeg, N. Jansonius
University Medical Center Groningen, University of Groningen, Groningen, The Netherlands

Purpose: To compare two perimetric progression detection algorithms in glaucoma: the EMGT algorithm (GPA) and a non-parametric algorithm based on mean deviation (NPA). The latter can easily be applied to any series of visual fields in a clinical setting without additional software require-
ments.

Methods: Two hundred twenty-one glaucoma patients with a reproducible glaucomatous visual field defect at baseline in at least one eye were followed prospectively with standard automated perimetry (HFA 30-2 SITA fast). All patients underwent complete ocular examination, with measurements of the IOP with Pascal and Air applanation tonometer and with 24-2 SITA-SWAP and 24-2 SITA-SAP. Test duration and global indices MD (mean defect) and PSD (pattern standard deviation) were compared.

Results: In 4 of the patients with ocular hypertension the 24-2 SITA-SWAP results were outside normal limits, showing ear-

ly paracentral visual field defects, while the 24-2 SITA-SAP in-
dicated within normal limits. In all of the POAG patients on the 24-2 SITA-SWAP tests bigger visual field defects were de-
tected, which were not found with the standard perimeter. SI-
TA-SWAP mean test duration was 3.48 ± 0.56, significantly less than SITA-SAP (5.01 ± 0.3 1).The mean MD for SITA-
SWAP was -3.32 ± 3.3, significantly different from SITA-SAP (-1.28 ± 1.2), indicating the influence of lens opacities on blue light transmission. The mean PSD for SITA-SWAP was 3.24 ± 1.05, different in comparison to that of SITA-SAP (1.65 ± 0.32), showing its better sensitivity in pointing out localized defects.

Conclusion: The results come in support of the view that SI-
TA-SWAP is shorter, easier to perform, but more challenging as compared to SITA-SAP by most of the patients. However it provides better sensitivity in detecting early visual field de-
facts in glaucoma suspects and can be considered as a helpful tool in glaucoma diagnostics.

Poster Session 22

PIGMENT DISPERSION (PDS)

P223

A COMPARISON OF INTER OCULAR DIFFERENCES IN PATIENTS WITH PIGMENT DISPERSION SYNDROME

L.W.L. Yip, N. Sothornwit, J. Berkowitz, F.S. Mikelberg
1 Department of Ophthalmology, Tan Tock Seng Hospital, Singapore, 2 Department of Ophthalmology and Visual Sciences, University of British Columbia, Vancouver, Canada, 3 Department of Family Practice, University of British Columbia, Vancouver, Canada

Purpose: Pigment dispersion syndrome (PDS) and pigmentary glaucoma are characterized by loss of iris pigment due to re-
verse pupillary block. The loss of iris pigment is manifested as transillumination defects. Differences in ocular anatomy have been found between subjects with PDS and controls. Our study aims to see if differences in interocular anatomical fea-
tures are also related to differences in the quantity of transil-
illumination defects between eyes.

Methods: This is an observational case series of 30 eyes of 15 subjects with pigment dispersion syndrome or pigmentary glaucoma in at least one eye. Patients underwent refraction, exophthalmometry, corneal and anterior chamber analysis by Pentacam, biometry, A-scan, ultrasound biomicroscopy and anterior segment digital photography.

Results: The Pentacam mean central radii of the posterior corneal surface (cornea back Rm) and KPD (influence of the posterior surface of the cornea on refractive power) were statistically different between eyes with greater pigment loss and eyes with lesser pigment loss. Eyes with greater pigment loss had a larger back radius of corneal curvature and a correspondingly numerically smaller KPD. Other measurements of ocular anatomy were not statisti-
cally significant.

Conclusions: A flatter curvature of the posterior corneal sur-
face of the eye is associated with increased pigment loss in pigment dispersion syndrome and pigmentary glaucoma. The authors postulate that this could result in a difference in the biomechanical properties of the cornea, increased deformation with blinking and a pumping action resulting in the re-
verse pupil block of PDS.
**Poster Session 23**

**PSEUDOEXFOLIATION**

**P224**

**CENTRAL CORNEAL THICKNESS IS REDUCED IN PSEUDOEXFOLIATION GLAUCOMA COMPARED WITH PRIMARY OPEN ANGLE GLAUCOMA**

A. Doyle1, C. Cleary1, C. Bailey1, R. Kirwan2
1 Royal Victoria Eye and Ear Hospital, Dublin, 2 St Vincents University Hospital and Royal Victoria Eye and Ear Hospital, Dublin, Ireland

Purpose: To compare central corneal thickness (CCT) in pseudoexfoliation glaucoma (PEXG) with primary open angle glaucoma (POAG).

Methods: Prospective cohort study of patients attending a tertiary glaucoma referral centre. We compared two groups of patients: PEXG (n = 45) and POAG (n = 43). One eye from each patient was randomly selected for inclusion in the study. We excluded patients with a history of intraocular or corneal surgery, laser procedures, intra-ocular inflammation, angle closure, keratoconus, or recent contact lens wear. First we collected data on the groups’ intra-ocular pressure (IOP), cup: disc ratio, number of anti-glaucoma agents and visual field loss. Next we measured CCT at the slitlamp using an ultrasound pachymeter.

Results: Intra-ocular pressure, cup: disc ratio and number of anti-glaucoma medications were not significantly different between the groups. However, mean CCT was 521 [509 - 533, 95% C.I.] in the PEXG group compared to a mean CCT of 540 [528 - 550, 95% C.I.] in the POAG group (p < 0.05). Visual field losses were also significantly worse in the PEXG group than in the POAG group (p < 0.05).

Conclusion: It is important to consider central corneal thickness when assessing patients with glaucoma. A reduced central corneal thickness in patients with pseudoexfoliation glaucoma (PEXG) may contribute to a worse outcome.

**P225**

**THE MANAGEMENT OF PSEUDOEXFOLIATIVE GLAUCOMA IN A ROMANIAN TERTIARY CENTER**

C. Danieleescu, D. Chiselita
Iasi University of Medicine and Pharmacy, Romania

Purpose: To analyze the course of the disease and the management of patients with pseudoexfoliative glaucoma in our clinic, a tertiary center for glaucoma.

Method: Retrospective chart review of patients admitted in the last 8 years (2000-2007).

Results: We have collected data concerning 330 eyes (238 patients). The mean follow-up period was 13.85 ± 11.03 months (limits 0.5-91 months). The mean visual acuity was 73 ± 25 Snellen. We have noted a progression of the C/D ratio- but not of the visual field parameters-during the follow-up period.

**P226**

**ANTIGEN MICROARRAY PROFILING OF SERUM AUTOANTIBODIES IN PSEUDOEXFOLIATION GLAUCOMA**

E. Dervan1, C. O’Brien2, S.L. Ho2, H. Chen1, J. Prehn1, D. Murphy1
1 Centre for Human Proteomics, Royal College of Surgeons in Ireland, Dublin, Ireland, 2 Institute of Ophthalmology, Mater Misericordiae University Hospital, Dublin, Ireland

Pseudoexfoliation syndrome (PEX) is currently the most important identifiable secondary cause for open-angle glaucoma with a worse clinical course and prognosis. Several studies have found complex IgG autoantibody repertoires and elevated serum titres of autoantibodies to many optic nerve and retinal antigens among glaucoma groups.

Objective: To screen serum for circulating autoantibodies (IgGs) from patients with PEX glaucoma and age and sex matched controls. This is to identify possible disease associated antigens and potential markers for the disease.

Methods: We profiled sera from 15 patients with PEX and 15 age and sex matched controls using high-density protein arrays of the expression libraries of fetal brain cDNA (hEX1), which expresses 10000 different His-tagged recombinant proteins from 37000 bacterial clones.

Results: We have identified 38 disease associated antigen markers (33-66% patients; 0-13% controls). Some of these proteins have been linked to neural development and degeneration. These include a NMDA like receptor, a reticulon, a fibroblast growth factor receptor and an elongation factor. We have also identified 55 non-disease associated antigen markers (33-60% controls; 0-13% patients).

Conclusion: Protein array analysis of autoantibody profiles of patients with PEX glaucoma may provide potential biomarkers for pseudoexfoliation and glaucoma. The above results require validation using reverse ELISA and western blot which is ongoing with the addition of a larger patient cohort.

**P227**

**INTRAOCULAR PRESSURE FOLLOWING PHACOEMULSIFICATION IN EYES WITH PSEUDOEXFOLIATIVE GLAUCOMA, OPEN ANGLE GLAUCOMA AND NORMAL CATARACT**

First Ophthalmology Department of Ankara, Ataturk Training and Research Hospital, Turkey

Purpose: To evaluate the changes in intraocular pressure (IOP) and glaucoma medication requirements after phacoemulsification and intraocular lens (IOL) implantation in eyes with pseudoexfoliative glaucoma, primary open angle glaucoma and normal cataract in the early and long-term period.

Methods: This retrospective study includes analysis of 114 eyes that underwent clear corneal phacoemulsification and IOL implantation in First Ophthalmology Department of Ankara Ataturk Training and Research Hospital. The eyes were classified into 3 groups: pseudoexfoliative glaucoma (PEX, n = 39), primary open angle glaucoma (POAG, n = 38) and normal cataract (NC, n = 37). None of the cases had history of previous intraocular surgery. Postoperative IOP levels...
and required glaucoma medications were collected 1 day, 1 week, 1-2-3-6 and 12 month after surgery.

Results: On the first postoperative day, the mean IOP increased in the PEX group from a mean preoperative level of 16.87 ± 5.14 mmHg to 17.92 ± 8.12 mmHg (1.05 mmHg increase; p = .052), in POAG group, mean IOP decreased from 18.97 ± 5.87 mmHg to 18.15 mmHg (0.82 mmHg decrease; p = .887) and in NC group the mean IOP rose from a mean preoperative level of 15.62 ± 3.81 mmHg to 16.38 ± 5.12 mmHg (0.75 mmHg increase; p = .072). One day postoperatively, 7 eyes in PEX group, 5 eyes in POAG group and 3 eyes in NC group had IOP rise to 25 mmHg or higher, but those postoperative IOP spikes had settled by 8 weeks. At 1, 2, 3, 6 and 12 month follow-up the IOP levels were statistically insignificantly decreased in each group (paired samples t-test p ≥ .05). The 12 month mean IOP measurements were 14.74 ± 4.47 mmHg, 14.38 ± 2.94 mmHg, 13.50 ± 2.51 mmHg in groups, respectively. The number of required glaucoma medications in both glaucoma groups showed statistically significant decrease at all follow-up exams from preoperative level (paired samples t-test p ≤ .01).

Conclusion: Cataract extraction by phacoemulsification in eyes with PEX, POAG and NC results in decrease in IOP and required glaucoma medication in the early and long-term period. On the first postoperative day, more frequent IOP spikes were observed in PEX group. In patients with PEX, POAG, NC a visually significant cataract and no advanced glaucomatous damage, phacoemulsification alone may be effective in IOP management.

P228
GENETIC ASSOCIATION OF FUNCTIONAL CANDIDATE GENES WITH PSEUDOEXFOLIATION SYNDROME AND PSEUDOEXFOLIATION GLAUCOMA
M. Krumbiegel1, F. Pasutolo1, C.Y. Mardin2, R. Lämmer2, B.H. Weber1, F.E. Kruse1, M. Zenkel2, U. Schlötzer-Schrehardt1, A. Reis1
1 Institute of Human Genetics, University of Erlangen-Nuremberg, Germany; 2 Department of Ophthalmology, University of Erlangen-Nuremberg, Germany; 3 Institute of Human Genetics, University of Regensburg, Germany

Purpose: PEX is an age related, systemic, elastic microfibrillopathy associated with potentially serious eye diseases and characterized by fibrillar-granular deposits in the anterior segment of the eye. A large number of different extracellular matrix proteins have been demonstrated to compose part of these deposits. However the exact etiology and pathogenesis of this condition remains unknown. Variable presence of PEX in different populations and increased risk of PEX in relatives of affected patients support a genetic basis for PEX. In the present study we focus on six functional candidate genes, found to be part of the deposits (e.g. FBN1, LTBP2, MFAP2, TGM2, TGF-B1 and CLU), and evaluate associations with PEX.

Methods: 50 single-nucleotide polymorphisms (SNPs) at the loci of the six functional candidate genes (29 in LTBP2, 5 in CLU, 5 in MFAP2, 5 in TGM2, 3 in TGF-B1 and 3 in FBN1) were genotyped in 333 unrelated PEX patients and 342 healthy individuals of German origins and a genetic association study was performed.

Results: An association with the disease was observed only for the SNP rs2279590 located in intron 8 of CLU gene (corrected P value = 0.0347). Neither remaining single SNPs nor SNP haplotypes were associated with PEX.

Conclusions: Our results suggest that genetic variation in CLU gene may represent a risk factor for PEX. Variants in FBN1, LTBP2, MFAP2, TGF-B1 and TGM2 do not play a major role in the etiology of PEX syndrome, at least in German patients.

P229
THE PREVALENCE OF PSEUDOEXFOLIATIVE GLAUCOMA IN CENTRAL RUSSIA
K. Natalia1, B. Andry2
1 EGS, 2 NO

Purpose: To determine the prevalence of pseudoexfoliative glaucoma (PEG) among glaucoma patients in the Central and Central-Chernozem regions of Russia. Methods: In a prospective study, 775 consecutive glaucoma patients in the six regions of Russia (Moscow, Ivanovo, Kostroma, Saratov, Yaroslavl and Kursk) were examined for PEG during the period between 2001 and 2006. The mean age of patients was 67.5 ± 7.78 years (range 40-89 years). Criteria used to diagnose PEG were the presence of pseudoexfoliation material on anterior segment structures (noted during slit-lamp biomicroscopy with pupil dilation) with evidence of glaucomatous damage.

Results: Pseudoexfoliation syndrome was detected in 501 patients (64.6%). The highest prevalence of PEG was obtained in Saratov and Kursk (80.2% – 71.6%, respectively). In Moscow the prevalence of PEG was only 46%. The condition was unilateral in 256 cases (33.0%) and bilateral in 519 cases (67.0%). The prevalence of PEG increased with age and dominated in the age groups 71-80 and older. The study included 420 (54.2%) females and 355 (45.8%) males. There was no significant sex difference in the prevalence of PEG.

Conclusions: The high frequency of PEG among Russian glaucoma clinic population was found in this study. There is high variation in the prevalence of PEG among people of different regions of central Russia. Further studies are needed to extend our knowledge of the epidemiology of PEG.

P230
LONG-TERM RESULTS OF DEEP SCLERECTOMY WITH COLLAGEN IMPLANT IN EXFOLIATIVE GLAUCOMA
E. Mendrinos1, K. Mansouri2, A. Merroud1, T. Shaaraawy1
1 Glaucoma Sector, Department of Ophthalmology, Geneva University Hospitals, Switzerland; 2 Jules Gonin Eye Hospital, University of Lausanne, Switzerland

Purpose: To evaluate the long-term results and complications of deep sclerectomy with collagen implant in exfoliative glaucoma (EXG).

Methods: A total of 22 eyes of 22 patients with medically uncontrolled EXG were consecutively included in this study and were followed-up prospectively. Intraocular pressure (IOP), number of anti-glaucoma medications, visual acuity and slit-lamp examination were performed before and after surgery at day 1, week 1 and at months 1, 3, 6, 9, 12, 18, 24, 30, 36, 48 and 54. Intraoperative and postoperative complications were recorded and managed accordingly. Complete success was defined as IOP ≤ 18 mmHg without anti-glaucoma medications and qualified success as IOP ≤ 18 mmHg with or without anti-glaucoma medications.

Results: The mean follow-up time was 42.5 ± 12.2 months (range 12-54). Mean IOP was significantly reduced from 29.9 ± 8.1 mmHg preoperatively to 12.2 ± 1.8 mmHg at month 54 (p < 0.0001). Complete and qualified success rates were 48 and 54. Intraoperative and postoperative complications were recorded and managed accordingly. Complete success was defined as IOP ≤ 18 mmHg without anti-glaucoma medications and qualified success as IOP ≤ 18 mmHg with or without anti-glaucoma medications.

Results: The mean follow-up time was 42.5 ± 12.2 months (range 12-54). Mean IOP was significantly reduced from 29.9 ± 8.1 mmHg preoperatively to 12.2 ± 1.8 mmHg at month 54 (p < 0.0001). Complete and qualified success rates were 48 and 54. Intraoperative and postoperative complications were recorded and managed accordingly. Complete success was defined as IOP ≤ 18 mmHg without anti-glaucoma medications and qualified success as IOP ≤ 18 mmHg with or without anti-glaucoma medications.

Results: The mean follow-up time was 42.5 ± 12.2 months (range 12-54). Mean IOP was significantly reduced from 29.9 ± 8.1 mmHg preoperatively to 12.2 ± 1.8 mmHg at month 54 (p < 0.0001). Complete and qualified success rates were 48 and 54. Intraoperative and postoperative complications were recorded and managed accordingly. Complete success was defined as IOP ≤ 18 mmHg without anti-glaucoma medications and qualified success as IOP ≤ 18 mmHg with or without anti-glaucoma medications.
to provide reasonable long-term IOP control in exfoliative glaucoma with few postoperative complications.

**P231**

**DIODE LASER TRABECULOPLASTY IN PATIENTS WITH PSEUDOEXFOLIATIVE GLAUCOMA**

A.米尔科维奇, V.安德列奇, N.巴宾

University Eye Clinic, Novi Sad, Serbia

**Objective:** Prospective study has been carried out to examine the efficacy of diode laser trabeculoplasty (DLT) in the treatment of pseudoexfoliative glaucoma.

Material and methodology: Laser trabeculoplasty was performed by Zeiss VISULAS 532s diode laser on 33 eyes of 20 patients with pseudoexfoliative glaucoma. Power of 750-1000 W was used, with a spot size of 100 microns and a pulse of 0.10 second. One hour before DLT Apraclonidine 1% was administered, and 5 days after the treatment Dexamethasone was administered. All patients underwent complete ophthalmic evaluation before and at intervals after treatment (7 days; 1, 3, 6 months postoperatively). During the follow-up period, patients were treated with the same topical anti-glaucoma medicaments as before DLT.

**Results:** Before treatment mean IOP was 23.7 ± 2.6 mmHg and 7 days after DLT IOP was 16.8 ± 2.1 mmHg that is 73.1% of initial number, 1 month after it was 14.3 ± 2.2mmHg, or 61.7%. After 3 months it was 13.9 ± 2.4 mmHg (61%) and after 6 months 13.83 ± 2.7 (60.1%). No side effects (either objective or subjective) were present in examined patients.

Conclusions: There is statistically significant difference between IOP before and after DLT, so it is concluded that diode laser trabeculoplasty is an effective mode of treatment for eyes with open-angle glaucoma or with ocular hypertension.

**P232**

**COMPARISON OF THE INTRAOCULAR PRESSURE LOWERING EFFECTS (IOP) OF LATANOPROST AND TIMOLOL IN PATIENTS WITH PSEUDEXFOLIATION GLAUCOMA**

M.拉多尼奇, N.米斯利奇, A.武坎诺维奇, B.斯蒂约维奇, S.哈利奇

1 Association Ophthalmology of Montenegro, 2 Association Paediatric of Montenegro

**Introduction:** Lindberg 1917 gave the first description of pseudoexfoliation glaucoma picture. Considering this form of glaucoma is not rare entity in our climate, we have considered as proper to compare treatment effects of some medicines and to give modest contributions in searching for the “first-line” therapy to this glaucoma form.

Materials and methods: The study was carried out in 36 patients who have shown up to the Ophthalmology checkup in the Clinical Center of Montenegro and to whom pseudoexfoliation Glaucoma diagnosis have been made. The patients were separated into two treatment groups, one of which as the first medicine included 0.005% latanoprost once a day, and the other included 0.5% timolol twice daily. The patients had been controlled over the next six months while we were determining IOP values, field of vision as well as daily IOP fluctuations to treated patients.

**Results:** From the total number of treated patients there were 58% male and 42% female persons. The IOP value was reduced for 30% by application of 0.005% latanoprost in comparison to initial values and by application of 0.5% timolol IOP values was reduced for 24%. In addition, there were noticed daily IOP fluctuations of less importance to the first group. It is important to emphasize that it was noticed significant change in iris color to two patients treated with 0.005% latanoprost.

**Conclusion:** In this preliminary study we found out that more significant IOP reduction was achieved by the application of 0.005% latanoprost once daily than by the application of 0.5% timolol twice a day. The results suggest that 0.005% latanoprost may be in a number of cases the first medicine (therapy) choice in patients with pseudoexfoliation glaucoma.

**Poster Session 24**

**RETINAL GANGLION CELLS, OPTIC NERVE HEAD**

**P234**

**THE EFFECT OF AGING ON RETINAL NERVE FIBER LAYER THICKNESS CHANGES AS MEASURED BY STRATUS OCT**

C. Ajtony, R. Füstös, J. Gaál, B. Kovács

University of Pécs, Clinical Center Dept. Ophthalmology, Hungary

**Purpose:** To determine the effect of age on the retinal nerve fiber layer (RNFL) thickness in Caucasian healthy eyes as measured by optical coherence tomography (Stratus OCT)
Methods: In a cross-sectional observational study, two hundred and thirty-seven subjects 10 to 70 years old were classified into different age groups (age 10-20 yrs, 20-30 yrs, 30-40 yrs, 40-50 yrs, 50-60 yrs, 60-70 yrs). Peripapillary Fast RNFL scans were performed by Stratus OCT on one randomly selected eye of each subject. Correlation was identified between age and RNFL thickness, and linear regression was evaluated to study the effect of age on the RNFL thickness. SPSS 11.0 was used for all statistical analyses.

Results: The mean average (AVG) RNFL thickness in our subjects grouped by decades was 99.44 ± 11.55, 93.80 ± 11.21, 99.55 ± 9.95, 96.62 ± 8.33, 94.95 ± 7.96, 93.64 ± 8.94. In our regression analyses age was treated as independent variable, while RNFL AVG as dependent variable. Loss of RNFL in the group was -0.072 µm/yr, -1.182 µm/yr, -0.434 µm/yr, -0.968 µm/yr, -0.313 µm/yr, -0.355 µm/yr, respectively.

Conclusions: The effect of aging on RNFL thickness is detectable throughout all ages. In young individuals there is almost a stable condition, while in the second and fourth decade a more pronounced RNFL loss can be detected. Understanding the age-related structural changes in the normal RNFL, we may get important information in assessing the pattern of pathological conditions, among them glaucomatous progression.

P235

EFFECTS OF ANTIBODIES AND SERA OF GLAUCOMA PATIENTS ON THE PROTEIN EXPRESSION PROFILES OF RETINAL GANGLION CELLS

K. Bell1, G. Seigel2, N. Pfeiffer1, F. Grus3
1 Experimental Ophthalmology, Dept. of Ophthalmology, University of Mainz, Germany, 2 Ross Eye Institute, University of Buffalo, USA

Purpose: Recent studies could demonstrate complex antibodies profiles in the serum of patients suffering from glaucoma against ocular antigens from the optic nerve head as well as the retina. The aim of the study was to discover the interaction of the serum of the patients with neuroretinal cells (R28) by measuring the protein expression profiles.

Methods: Neuroretinal cells were incubated with DMEM medium containing 10% serum either from healthy people or POAG patients or 10% glaucoma serum after antibody removal with protein G beads. After addition of the medium the proteins a panel of 6 highly significant biomarkers was calculated (Wilks’ = 0.0289 p < 0.001) by analysis of discrimination. The Mahalanobis distances revealed the largest distance between the cells treated with POAG serum and elevated pressure from the control cells incubated with healthy serum (Mahalanobis distance = 40; p < 0.0001). A variance analysis showed a highly significant effect of the combination of glaucoma serum and elevated pressure (p < 0.001). Furthermore, we could demonstrate that the removal of the antibodies from POAG serum significantly moved the protein profiles toward those of the cells incubated with control medium.

Conclusions: Serum from POAG patients showed significant changes in the protein expression profiles of neuroretinal cells compared to those incubated with healthy serum. The effect was even larger if the cells were incubated under elevated pressure. The removal of the antibodies could partly reduce this reaction. These results demonstrate that the antibodies found in the serum of the patients could play a role in the disease glaucoma by possibly making the cells more vulnerable to pressure.

P236

CHANGES OF RETINAL GLUTAMATE TRANSPORTER EXPRESSIONS AND RETINAL MULLER CELL RESPONSES IN EXPERIMENTAL GLAUCOMA RAT MODEL

J.H. Kim1, N.Y. Lee1, S.M. Hyung2, K.B. Uhm3, K.R. Ju4, C.K. Park1, J.I. Moon1, M.D. Ahn1, N.H. Baek1
1 Department of Ophthalmology, College of Medicine, The Catholic University of Korea, Seoul, 2 Department of Ophthalmology, School of Medicine, Chungbuk National University Hospital, Cheongju, 3 Department of Ophthalmology, College of Medicine, Hanyang University, Seoul, Korea

Purpose: We examined the expression of the glutamate transporter subtypes, locations and their changes. An additional aim was to determine the retinal Muller cell responses that produce the main retinal glutamate transporter in the retina of chronic ocular hypertension rat.

Methods: Experimental glaucoma was induced in one eye of rats by catartering three episcleral vessels. The amount of retinal ganglion cells (RGCs) loss was also examined by counting the retrograde labeled ganglion cells in the whole mount retina. GLAST (EAAT-1) and GLT-1 (EAAT-2) were quantified by immunohistochemistry and western blotting. The level of retinal stress was determined by the level of the glial fibrillary acidic protein (GFAP) and p53 expression.

Results: After an experimental glaucoma period of between 1 and 6 weeks, all the catartered eyes showed significant RGCs loss. The GFAP and p53 expression levels increased gradually in the retinal Muller cells of all the treated eyes. The GLT-1 level increased significantly in the experimental rat glaucoma model but the GLAST level was largely unaffected. The pattern of GFAP and p53 expression showed that retinal Muller cells were under stress as a result of the chronic IOP elevation.

Conclusions: Impaired GLAST formation caused by a Muller cell dysfunction might play a role in the glutamate excitotoxicity in glaucomatous neurodegeneration.

P237

EVALUATION OF THE NEW GLAUCOMA MODULE OF SOCT COPERNICUS IN DIAGNOSTICS OF PRIMARY OPEN ANGLE GLAUCOMA PATIENTS

J. Wasylyk1, B. Terelak-Borys1, I. Grabiska-Liberek1, K. Czechowicz-Janicka1, I. Jankowska-Lech1
1 Department of Ophthalmology, Centre of Postgraduate Medical Education, Warsaw, Poland, 2 Institute of Glaucoma, Warsaw, Poland

Purpose: The aim of this pilot study was to evaluate clinical applicability of the new introduced glaucoma module of Spectral OCT “Copernicus” device. We attempted to compare the examinations results to the clinical view of the patient as well to the other already established RNFL and optic disc imaging techniques.

Methods: 11 patients (20 eyes) with the moderate to advanced primary open angle glaucoma were included into this study (on topical therapy, without history of the surgical / laser intervention). We have performed 3D SOCT scans of the fundus using the disc and RNFL glaucoma analysis module.
The complete ophthalmological examination of each patient was performed prior to the SOCT tests. During the period of one to three week, other imaging procedures were employed - Heidelberg Retinal Tomography and GDxVCC. Statistical analysis and comparison of the outcomes was performed.

Results: Topographical parameters of the ONH discs and retinal nerve fiber layer parameters were in significant correlation between SOCT and HTII/GDxVCC tests for the same eyes. Conclusion: The glaucoma 3D disc and RNFL imaging module of the spectral OCT "Copernicus" may be the useful tool in glaucoma diagnostics and follow up.

**Poster Session 25**

**SECONDARY GLAUCOMAS**

**P238**

**SUBTENON’S TRIAMCINOLONE ACETONIDE EXTRACTION IN REFRACTORY STERIOD INDUCED GLAUCOMA**

E. Arrondo, C. Pallas, A. Adan
MD, Barcelona, Spain

Purpose: We report four cases of refractory steroid-induced hypertension after subttenon’s triamcinolone acetoni injection in which the intraocular pressure (IOP) normalized after removing the remaining steroid from the subtenon space. Methods: 4 patients who underwent triamcinolone acetoni injections as a treatment for cystoid macular edema secondary to uveitis or epiretinal membrane, showed an increase in IOP refractory to all topical and systemic hypotensive agents a few weeks after the injection. We decided to remove the triamcinolone from the subconjunctival space under topical anesthesia in all patients. Results: The IOP dropped to normal levels the next day after the surgery in all 4 patients, and remained stable for all the follow up period (3-12 months) with no hypotensive medica tion needed, except for 1 patient which is under topical antiglaucoma monotherapy. Conclusions: Removing the triamcinolone acetoni from the subtenon space is a safe and simple alternative to filtering surgery in patients with steroid induced glaucoma or hypertension.

**P239**

**INTRAVITREAL BEVACIZUMAB IN THE MANAGEMENT OF NEOVASCULAR GLAUCOMA**

E. Guerra, T. Gomes, A. Fernandes Fonseca, J. Segurado, A. Aguilar
Centro Oftalmológico de Lisboa, Portugal

Purpose: To describe five cases of neovascular glaucoma (NVG) caused by central retinal vein occlusion who received intravitreal bevacizumab (Avastin®). Design: Prospective interventional case series. Methods: Five patients with a symptomatic, refractory elevation of intraocular pressure and anterior segment congestion in the context of NVG received intravitreal bevacizumab (1.25 mg/0.05 ml). Follow-up examinations occurred at 24 hours, 10 days, one and three months. Results: Intravitreal bevacizumab resulted in a marked regression of ruberosis within 24 hours. IOP decreased in three patients, with regression of symptoms; in two patients, other adjunctive therapeutic measures were necessary; in one, trabeculectomy was performed without hemorrhagic complica-

**P240**

**LENS-PARTICLE GLAUCOMA 34 YEARS AFTER OCULAR INJURY**

L. Jáñez, E. Gutiérrez, L. Lago
Hospital 12 de Octubre, Madrid, Spain

Introduction: Lens-particle glaucoma, a subclassification of lens-induced glaucoma, is a type of secondary open-angle glaucoma, following surgery or injury, involving intraocular retention of fragmented lens material which obstructs aqueous outflow. Case report: A 79-year-old woman was admitted to the hospital with intense pain in her left eye. She reported an ocular injury to the left eye 34 years ago and had remained asymptomatic since then. VA right eye: 20/40; VA left eye: amaurosis. Anterior segment: conjunctival hyperemia with ciliar injection, corneal edema, mid-dilated pupil, aphonacia, anterior chamber cell and flare reaction. Intraocular pressure (IOP) was 42 mmHg left eye. In the left eye, fundoscopy showed lens luxation into the vitreous. IOP was reduced to 32 mmHg with topical and systemic hypotensor and anti-inflammatory treatment. She was discharged on topical dexamethasone, dorzolamide and cyclopentolate. She was followed up and remained asymptomatic, with slight residual corneal edema. IOP right eye: 18 mmHg; IOP left eye:52 mmHg. The patient was given the option of posterior vitrectomy with lens extraction but she refused surgery because of her family situation, therefore dexamethasone 1 drop every 4 hours and atropine 1 drop every 24 hours were prescribed. At her next follow-up appointment, she complained of persistent left eye pain no longer relieved with oral analgesics. She refused surgery again, thus she was treated with retrobulbar alcohol injection. Conclusions: The patient remained asymptomatic for 34 years, with lens luxation into the vitreous without any treatment, until she was forced to go to the hospital because of sudden pain in her left eye. o The patient refused surgery, thus palliative treatment was given.

**P241**

**THE ROLE OF BEVACIZUMAB IN THE TREATMENT OF NEOVASCULAR GLAUCOMA**

K. Novak Laus¹, Z. Mandić¹, M. Zorić Geber², B. Andrijevic derk¹, Z. Vatavuk¹, L. Bojic²

1 University Department of Ophthalmology, Clinical Hospital "Sestre Milosrdnice", Zagreb, Croatia, 2 University Department of Ophthalmology, Clinical Hospital Split, Split, Croatia

Purpose: To present our experience with intravitreal bevacizumab in the treatment of neovascular glaucoma (NVG).
Patients and methods: Twelve eyes of twelve patients with neovascular glaucoma were treated with intravitreal bevacizumab. In eight eyes NVG was secondary to proliferative diabetic retinopathy. The other four were secondary to central retinal vein occlusion. All eyes had iris and angle neovascularisation and symptomatic elevation of intraocular pressure (IOP). Each patient received a single intravitreal injection of 1.25 mg bevacizumab. Additional treatment was performed only if IOP was not well controlled with full topical anti glaucoma therapy. Seven patients received panretinal photocoagulation (PRP), and one of these required trabeculectomy with mitomycin-C. The other five patients received cryovertinopexy and after that combined phacoemulsification and Ahmed Glaucoma Valve implantation because of dense cataract, elevated IOP and limited synechiae. After cataract surgery, these patients received PRP. All patients were followed-up for a minimum of three months.

Results: All patients demonstrated rapid regression of iris neovascularisation. Mean time from bevacizumab injection to regression of the neovascularisation was 4 days. IOP was well controlled in six patients and the other six patients received additional treatment. Preoperative visual acuity ranged from hand motion (HM) to 0.075, postoperative visual acuity ranged from HM to 0.1. Mean IOP before treatment was 48.6 mmHg. Mean IOP after treatment was 22.3 mmHg. No side effects or complications were noted from intravitreal bevacizumab.

Conclusion: Intravitreal bevacizumab may be an important additional treatment option for the rapid regression of the neovascularisation in NVG patients. This method results in imminent but not permanent regression of iris and angle neovascularisation. More cases are needed to evaluate future effectiveness and usefulness of this method.

P242
INTRAOCULAR PRESSURE CHANGES FOLLOWING PENETRATING KERATOPLASTY: IS IT CASUAL OR IS IT USUAL?
A. Ozer, N. Yildirim, A. Sahin, H. Erdogan
Eskisehir Osmangazi University Medical Faculty, Department of Ophthalmology, Eskisehir, Turkey

Purpose: Elevated intraocular pressure after keratoplasty is a well-recognized phenomenon. The purpose of this study is to evaluate the incidence, risk factors and management of intracocular pressure rise following penetrating keratoplasty (PK) and to check for possible causes with the underlying etiology for PK.

Methods: One hundred thirty one eyes of 131 patients that had undergone PK were retrospectively studied. Patients with increased intraocular pressure after PK were identified. The primary indications for keratoplasty, preoperative and postoperative detailed ophthalmologic examinations including IOP measurements of those were recorded. The mean follow-up was 5 years and the minimal follow-up period was at least 12 months after the last transplantation.

Results: Postoperative IOP rise affected 34 eyes (25.9%) of 34 eyes (14.7%) had preexisting glaucoma. Surgical intervention (Ahmed glaucoma valve) was required in 3 of these eyes (8.1%) and in one (2.94%) patient diode laser cyclophotocoagulation was performed to control raised intraocular pressure. IOP rise was controlled in 31 eyes by medical treatment. Five patients (14.7%) undergone PK twice, one of them had pressure rise after both keratoplasties and 4 had rise after the second PK. Two of those 5 patients (40%) had clear regrafts. In 3 of the 5 eyes (60%), regrafts failed due to uncontrolled IOP rise and/or other causes. At the end of the follow-up period, visual acuity was 20/30 to 20/200 in 19 eyes (55.88%), counting fingers from less than 20 ft in 14 eyes (41.17%), and hand movement/light perception in 1 eye (2.94%).

Conclusion: The development of increased IOP after PK varied with the indication for keratoplasty. Postkeratoplasty IOP rise seems to be strongly associated with preexisting pseudophakic bullous keratopathy. Prompt treatment are warranted to increase the survival of the graft and to avoid visual loss in eyes affected by IOP rise.

Poster Session 26
TONOMETRY, PACHYMETRY

P243
OCULAR RESPONSE ANALYZER COMPARED TO GOLDMANN APPLANATION TONOMETRY FOR INTRAOCULAR PRESSURE MEASUREMENTS
O. Abitbol, F. Audren, S. Doan, D. Gatinel
Rothschild Foundation, Paris, France

Purpose: To evaluate the relationship between intra-ocular pressure (IOP) measurements obtained with the Goldmann applanation tonometry (GAT), and with the Ocular Response Analyzer (ORA) (Goldmann-correlated IOP (IOPG) and corneal-compensated IOP (IOPCC)) in patients with glaucoma or ocular hypertension. The effects of central corneal thickness on the measures obtained were also analysed.

Methods: Observational clinical study. IOP was determined with GAT and ORA in 231 eyes of 240 patients. In all patients, CCT was measured by ultrasound pachymetry.

Results: ORA IOPG readings were higher than GAT measurements (IOPG-GAT mean difference, 2.7 ± 2.7 mmHg). ORA IOPCC readings were also higher than GAT readings (IOPCC-GAT mean difference, 3.8 ± 3.4 mmHg). Differences increased with increasing GAT IOP. IOPG and GAT measurements both showed correlation with CCT (CCT versus IOPG: r = 0.25, p < 0.0001; CCT versus GAT IOP: r = 0.17, p < 0.01). However, IOPCC showed no correlation with CCT (r = 0.11, p = 0.078).

Conclusion: The ORA overestimates IOP compared with the GAT. ORA IOPCC measurements seem to provide an estimate of IOP that is less influenced by CCT than those provided with GAT.

P244
CORNEAL THICKNESS IN HIGH TENSION GLAUCOMA (HTG) PATIENTS WITH AND WITHOUT ACQUIRED PIT OF THE OPTIC NERVE (APON)
P. Alemany1, S. Jimenez1, F. Falide1, J. Jordano1
1 Puerta del Mar Universitary Hospital, University of Cadiz, Spain

Purpose: Central corneal thickness (CCT) in normal tension glaucoma (NTG) patients is lower than in high tension (HTG) patients. Lower values of CCT seem to be related with greater glaucoma damage in primary open angle glaucoma patients. APON is a prognostic factor for progression in glaucoma patients. Our study establishes the comparison of CCT in high tension glaucoma patients with and without APON.

Methods: Case-control, prospective study. Central corneal thickness was measured by ultrasound pachymetry in 34 eyes of 17 patients with acquired pit of the optic nerve (10 women), and 40 eyes of 20 patients with moderate-advanced HTG (11
RESULTS: The mean age of the patients with and without APON was of 65.4 and 66.5 years respectively. Mean defect was -14.64 in APON patients and -15.02 in moderate-advanced HTG. Differences in age and visual field damage are not statistically significant. The mean CCT value in APON patients was 493 ± 21.5 microns, median 498 microns. Mean CCT value in high glaucoma patients without acquired pit was 533 ± 24.1 microns, median 532 microns (p < 0.0001).

Conclusions: High tension glaucoma patients with acquired pit of the optic nerve had significantly lower central corneal thickness than high tension glaucoma patients with similar functional damage without acquired pit. Low CCT values seem to be implicated in the development of an acquired pit in high tension glaucoma patients.

P245
LOW CORNEAL HYSTERESIS AS A RISK FACTOR OF POAG PROGRESSION
L. Arutunyan, E. Iomdina
Moscow Helmholtz Research Institute of Eye Diseases, Russia

Purpose: To determine interrelations between the basic biomechanical parameters of the cornea, IOP level, glaucoma stages, and progression.

Methods: 221 eyes at different stages of primary open-angle glaucoma (POAG) were tested using the Reichert Ocular Response Analyzer, which measures corneal hysteresis (CH), corneal resistance factor (CRF), central corneal thickness (CCT), and intraocular pressure. The patients were divided into two groups with normal (8.3-11.7 mmHg) and low (5.1-8.2 mmHg) values of corneal hysteresis. Patients of the study groups were followed for 2 years: tests were taken using a Humphrey field analyzer for mean defect (MD) and pattern standard deviation (PSD) and a Heidelberg retina tomograph for rim volume (RV) and retinal nerve fiber layer (RNFL).

Results: At follow-up start, the group with normal corneal hysteresis showed the following values: MD -1.2 dB, PSD 3.1 dB, RV 0.41 mm², RNFL 0.23 mm. The respective values for low corneal hysteresis group were: MD -5.6 dB, PSD 6.4 dB, RV 0.19 mm, RNFL 0.21 mm. Over the follow-up period, all parameters in the latter group demonstrated a decrease. Specifically, the nervous fiber layer of patients with low CH value turned out to be thinner than in patients with normal CH. Patients with low CH values also showed a more expressed loss of photosensitivity of the retina. Spearman correlation analysis revealed true correlation between CH and permittivity indices (R = -0.56, p < 0.0001).

Conclusion: Biomechanical parameters of the eye at different POAG stages are significantly different. Their changes matched the advancement of glaucomatous damage. Low CH and thinner CCT present a greater risk of visual field reduction, manifested in more expressed changes of perimeter and of the condition of nervous fibres. These changes can thus be viewed as risk factors for POAG progression. The interrelation between CH and IOP values can be used as a determining criterion of target pressure and, hence, for the evaluation of medical treatment efficiency.

P246
RELATIONSHIP BETWEEN CORNEAL BIOMECHANICAL FACTORS AND IOP GOLDMANN
J. Hernandez-Barahona1, J. Benitez-del-Castillo2, J. Belda3, E. Molina2
1 Hospital Universitario de Valme de Sevilla, 2 Hospital General S.A.S. de Jerez, 3 Hospital de Torrevieja de Alicante, Spain

Purpose: To measure corneal hysteresis (CH) and corneal resistance factor (CRF) with ORA and to study their relationship with IOP Goldmann applanation values, with IOP Goldmann applanation values adjusted based on pachymetry and with IOP Goldmann-correlated values provided by ORA (IOPg).

Methods: A cross-sectional study of 109 eyes of 55 patients (glaucomatous, ocular hypertensives and normals) that have been subjected to ORA tonometry, measuring CH and CRF, ultrasonic pachymetry, measuring central corneal thickness (CCT) and Goldmann applanation tonometry. Pearson’s correlation coefficients between different parameters have been calculated.

Results: CH is not correlated with IOP Goldmann (r = -0.09, IC 95% -0.27 a 0.09, p = 0.34) nor with adjusted IOP Goldmann based on CCT (r = -0.01, IC 95% -0.35 a 0.01, p = 0.06) nor with ORA IOPg (r = -0.16, IC 95% -0.33 a 0.02, p = 0.09). CRF is correlated with IOP Goldmann (r = 0.49, IC 95% 0.34 a 0.62, p < 0.0001), with adjusted IOP Goldmann based on CCT (r = 0.41, IC 95% 0.24 a 0.46, p < 0.0001) and with IOPg (r = 0.45, IC 95% 0.29 a 0.59, p < 0.0001).

Conclusions: CH is not correlated with IOP Goldmann. CRF is moderately correlated with IOP Goldmann, even when adjusted based on CCT.

P247
EFFECTS OF ACUTE INCREASES OF THE INTRAOCULAR PRESSURE ON THE CORNEAL PACHYMETRY IN EYES TREATED WITH TRAVOPROST. AN ANIMAL STUDY
G. Bolivar, M. Teus, C. Gutierrez-Ortiz, M. Castejon
Hospital Universitario Príncipe de Asturias, Alcalá de Henares, Madrid, Spain

Purpose: To observe if topical prostaglandin therapy modifies the corneal thickness and the effect of acute changes of the intraocular pressure on the corneal pachymetry in rabbit eyes.

Methods: Prospective, controlled study with 6 rabbits treated unilaterally with travoprost for 1 month. The treated eye was the “study” eye, and the untreated eye was the control eye. The intraocular pressure in the anterior chamber was measured by direct cannulation, and the pachymetry was measured by an ultrasonic pachymeter, under general anaesthesia. We measured the basal corneal thickness, and repeated the measurement after increasing the intraocular pressure (IOP) to 15 and to 30 mmHg in both prostaglandin treated and in untreated, control eyes.

Results: We obtain statistically significant differences in the basal corneal thickness in both groups (p < 0.01) and in the decrease of corneal thickness that was observed after increasing the IOP to 15 mmHg (p = 0.01) and to 30 mmHg (p = 0.02).

Conclusions: Topical prostaglandin analogue therapy induces changes in the cornea of rabbits that imply differences in the corneal thickness at the basal level, and also a different corneal response to acute changes of intraocular pressure.

P248
INTRAOCULAR DAILY PRESSURE CURVE: USEFULNESS OF A NEW METHODOLOGY IN GLAUCOMA SUSPECTS PATIENTS
R. Borron
University of Buenos Aires; School of Medicine; Ophthalmology Department, Argentina

Purpose: To evaluate the practical usefulness of a new methodology of Intraocular Daily Pressure Curve (IODPC) in a sample of glaucoma suspects patients.
Design: observational, descriptive, retrospective study.

Method: The first measure of Intraocular Pressure (IOP) was recorded at 8 a.m. in supine position after 45 minutes of rest in this situation. The others measures were made as usual, every 3 hours, in sitting position from 11 a.m. to 8 p.m. (Godmann applanation tonometry). In a sample of 20 consecutive IODPC performed in glaucoma suspects patients, with IOP superior to 21 mmHg (in at least one eye) in supine position in the morning, the new method usefulness is analyzed by comparing the peaks, range of fluctuation, media and standard deviation with and without the first value in supine position. This statistics values are correlated with an structural (Heidelberg Retina Tomograph - HRT) and functional analysis of the optic nerve (Computed Visual Field - Octopus 1-2-3, G1X). An IOP > 21 mmHg and 4 mmHg superior to the others values of the DIOPC was considered "a peak". Range of fluctuation of > 6 mmHg (difference between the maximum and minimum IOP of the IODPC), a daily Media of more than 19.2 mmHg and a Standard Deviation (S.D.) superior to 2.1 mmHg were considered significant.

Results: In the sample of glaucoma suspects patients: a) only 25.64% (10 / 39) of eyes with ocular hypertension (I.O.P. > 21 mmHg) would have been detected with the measures registered in sitting position; b) 65.51% (19 / 29) of eyes with peaks of hypertension and 53.12% (17 / 32) of eyes with hight I.O.P. range of fluctuation, which were exclusively detected in supine position, the Media was pathological in 65% (26/40) of eyes vs. 37.5% (15/40) and the S.D. in 90% (36/40) vs. 25% (10/40). With the new method it was detected a pathological S.D. in 89.65% (26 / 29) of eyes with optic nerve lesion vs. 31.03% (9 / 29) without the supine IOP value in the morning.

Conclusions: The I.O.P. registered at 8 A.M. with the patient in supine position after 45 minutes of rest, allows identify peaks and fluctuations, main risk factors of glaucomatous optic neuropathy. The new strategy for the IODPC would enable its diffusion into the daily practice when admittance or house medications. ORA readings seemed to provide an IOP measurement that is only weakly influenced by corneal thickness.

P249

CLINICAL EVALUATION OF THE REICHERT OCULAR RESPONSE ANALYZER IN A GLAUCOMA CARE SETTING

M. Detry-Morel1, J. Jamart2, S. Pourjavani3

1 St. Luc University Hospital, Université Catholique De Louvain, Brussels, 2 St. Luc University Hospital, Université Catholique De Louvain, Yvoir, Belgium

Purpose: To determine corneal hysteresis (CH) and corneal resistance factor (CRF) using ORA in glaucoma patients in comparison with normal’s. To assess correlations between measured corneal compensated IOP (IOPcc), Goldmann correlated IOP (ORAg), Goldmann applanation tonometry (GAT) and CCT.

Design: Clinical, prospective, controlled case study including 155 patients (155 eyes) with glaucoma or OH recruited randomly in a glaucoma practice and 29 normal subjects (29 eyes).

Methods: Subjects underwent evaluations with both ORA and GAT several weeks apart. Wilcoxon and Kruskal-Wallis tests were used for comparison between two or more subgroups and Spearman coefficient to assess correlation.

Results: Among 184 subjects, IOPcc (18.1 ± 4.7 mmHg) was higher than IOP GAT (17.3 ± 4.0 mmHg) (p < 0.001). IOPcc, ORAg and GAT IOP were highly correlated (p < 0.001). Mean CH and CRF were lower in glaucoma (9.2 ± 1.6 mmHg, 9.9 ± 2.0 mmHg) than in controls (11 ± 1.7 mmHg, 11 ± 1.9 mmHg) (CH, p < 0.001; CRF, p = 0.008). CH and CRF were not significantly different between the 1st and 2d measurements (CH; p = 0.314; CRF, p = 0.09). Mean CRF was lower in untreated glaucoma (9.6 ± 2.0 mmHg) than in non-treated patients (10.9 ± 1.8 mmHg) (p < 0.001). CH was independent of the type of glaucoma (p > 0.05). There was a non-significant trend to a lower CH and CRF with increasing age, to a weak correlation between IOPcc and CCT and between the difference IOP GAT- IOPcc and CCT (r = 0.22). CH and CRF were correlated with CCT (p = 0.001).

Conclusion: ORA overestimated IOP compared to GAT. ORA IOP and GAT results were strongly correlated. Corneal biomechanic properties including CH and CRF were significantly lower in glaucoma than in normal’s. CH and CR did not change in the medium-term and were possibly influenced by medications. ORA readings seemed to provide an IOP measurement that is only weakly influenced by corneal thickness.

P250

CALIBRATION OF TONOMETERS - MODERN TONOMETERS

J.A. Draeger1, T. Schwenteki2

1 Hamburg-University, Dept. of Ophthalmology, Hamburg, Germany, 2 Physikalisch-Technische Bundesanstalt, Bremen, Germany

Purpose: There are demands and requirements for the measurement accuracy of modern tonometers which are applied for the accurate determination of intraocular pressure. Methods: Only precise calibration of modern tonometers guarantees reliability of measurements assessed for clinical diagnosis. The calibration of modern tonometers is performed by clinical comparison measurements with a reference tonometer. Tonometers with an other design as the application tonometer after Goldmann (reference tonometer) have to be tested and checked by these comparison measurements.

Results: The basis for the tonometer calibration is the international standard of tonometers ISO 8612. For data analysis of clinical comparison measurements the difference methods and the total method of least squares are applied. In contrast to ordinary method of least squares, the mostly used procedure, the total method of least squares provides unsatisfactorily and unbiased estimators for the parameter slope and interception of regression line.

Conclusion: In this way a correct evaluation and assessment of the test tonometer are guaranteed.

P251

INCREASED CENTRAL CORNEAL THICKNESS (CCT) RESULTS IN A HIGH FALSE-POSITIVE RATE OF GLAUCOMA REFERRALS BY OPTOMETRISTS

K. Falzon, C. O’Brien

Ophthalmology Department, Mater Misericordiae University Hospital, Dublin, Ireland

Introduction: Nearly half of those referred by optometrists for specialist glaucoma assessment are discharged at the first visit, whilst a diagnosis of ocular hypertension (OHT) is made in approximately 30% (Salmon, 2005). A significant number of patients with OHT have a normal intraocular pressure (IOP) if CCT is taken into account (Argus, 1995).

Purpose: To assess whether CCT is a confounding factor in patients referred by optometrists with high IOP for specialist glaucoma assessment.

Methods: The charts of 54 patients referred with high IOP to one glaucoma specialist between January and September 2007 were analysed. IOP was determined by Goldmann applanation tonometry (GAT) and CCT measured by ultrasonic pachymetry (Pachmate®). Both were measured by the same
specialist. Measured IOPs were defined as being normal or borderline/high (± 18 or ± 19 respectively). A 2-sample, 2-tailed T-test was used to compare the 2 groups.

Results: Mean referral optometric IOP was 25.9 ± 3.5. Clinic-based GAT showed that 28/54 eyes (51.9%) had normal IOP (mean CCT 597 micron, 95% CI 586-608). The rest had borderline/high IOP (mean CCT 573 micron, 95% CI 566-580).

The differences of mean CCT between the groups were highly significant (p < 0.001). Furthermore, when corrected for CCT, 65% (17/26) of eyes with borderline/high IOP had normal IOP.

Conclusions: 80% of optometric referrals (45/54) with high IOP were found to have normal values following GAT and correction for CCT. Thus corneal pachymetry should be considered by optometrists for glaucoma screening.

P252
CENTRAL CORNEAL THICKNESS AND CORRECTION OF INTRAOCULAR PRESSURE IN PATIENTS WITH PRIMARY OPEN-ANGLE GLAUCOMA AND OCULAR HYPERTENSION
E. Files-Bradaric
Eye clinic, Clinical Center of Montenegro, Podgorica, Montenegro

Purpose: Central corneal thickness (CCT) influences the values of intraocular pressure (IOP) measurement by Goldman applanation tonometer (GAT). The aim of this study was to determine how frequently the IOP have to be corrected because of CCT in patients with primary open-angle glaucoma (POAG) and ocular hypertension (OH).

Methods: CCT was measured in 185 patients (370 eyes), 96 patients (192 eyes) with POAG and 89 patients (178 eyes) with OH, using ultrasound pachymetry. The values of IOP were corrected using correction formula by Ehlers et al.

Results: Average CCT obtained was 570.6 µm. CCT in POAG group 580µm had 56 (29.2%) eyes. CCT in OH group 580 µm had 60 (33.7%) eyes. Correction of IOP ± 2 mmHg and above needed in 34 (35.4%) patients on both eyes and 10 (10.4%) patients on one eye in POAG group and in OH group 27 (30.3%) patients on both eyes and 6 (6.7%) patients on one eye.

Conclusion: The study showed that the values of IOP measurement by GAT have to be corrected by CCT measurement in clinically significant degree. Therefore, CCT measurement should be included in the complete ocular examination of all patients with POAG and OH for proper diagnosis and management.

P253
CORNEAL THICKNESS IN TYPE II DIABETIC OCULAR HYPERTENSIVE PATIENTS
S. Jimenez1, P. Alemany1, J. Falide2, J. Jordano3
1 Puerta del Mar University Hospital, University of Cadiz, Spain
2 University of Cadiz, 3 Puerto Real University Hospital, University of Cadiz, Spain

Purpose: Endothelial corneal dysfunction in diabetic patients has been described. Corneal thickness in these patients seems to be related to duration of diabetes in a type I - type II mixed population. This study evaluated the central corneal thickness differences between ocular hypertensive and non hypertensive diabetic type II patients with similar diabetic ocular disease.

Methods: Prospective, transversal study. Ultrasonographic central corneal thickness measurement has been performed in 59 type II diabetic patients with ocular hypertension (DM-HT) and 61 type II diabetic patients (DM) with normal intraocular pressure. Both groups have similar sex proportion, mean age, diabetic disease duration and severity referred to retinal disease stage and decimal visual acuity. A 2 sample, 2-tailed t test was used to compare DM and DMOHT results.

Results: Mean age in DM and DMOHT patients is 63.9 y 64.8 years respectively. Mean duration of disease is 13.3 and 13 years. Right eye and left eye CCT values in DM sample is 545 ± 29 microns in both eyes. CCT in DMOHT is 570 ± 34 and 572 ± 33 for right and left eye respectively. There is not statistically significant difference between right and left eye in every group. The difference between DM and DMOHT CCT values is statistically significant for both eyes (p < 0.001).

Conclusions: Ocular hypertensive type II diabetic patients have ticker corneas that type II ocular normotensive patients with similar ocular diabetic disease severity, in our study. Diabetic disease seems not to be the reason for a thicker cornea in type II patients with ocular hypertension.

P254
THE DIFFERENCE OF DIURNAL INTRAOCULAR PRESSURE FLUCTUATION BETWEEN RIGHT AND LEFT EYE IN NORMAL INDIVIDUALS
J.M. Kim1, M.S. Kim1, K. Park1, T.W. Kim2, D.M. Kim2, J.W. Koh3
1 Department of Ophthalmology, Kangbuk Samsung Hospital, School of Medicine, Sungkyunkwan University, 2 Department of Ophthalmology, Seoul National University College of Medicine, 3 Department of Ophthalmology, Chosun University Hospital, Korea

Purpose: To evaluate symmetry of diurnal IOP fluctuation between fellow eyes.

Materials and methods: 100 normal subjects were enrolled without previous ocular disease and lesion possible to affect the IOP. Diurnal IOP measurements were performed with Goldman applanation tonometer every 2 hours from 9 AM to 11 PM. Repeated measure ANOVA was conducted for symmetry of IOP between the fellow eyes with time. Pearson correlation coefficient of IOP between the fellow eyes at each time points, peak, trough, range and mean. Absolute differences of IOP and changes in IOP at given time intervals between the fellow eyes and their proportion exceeding 2 mmHg, 10% and 15% were calculated. Biometry, demographic features and individual factors were obtained for the correlation with IOP profiles.

Results: The diurnal curve of both eyes showed symmetry between both eyes according to repeated measure ANOVA (p = 0.87, between subject effects) and high Pearson correlation coefficient ranging from 0.594 to 0.896. The mean absolute differences between the fellow eyes ranged from 0.78 to 1.19 mmHg and their proportion at each given cut off value were 18.2 - 31.2% at 10%, 9.1 - 22.1% at 15% and 3.9% - 6.5% at 2 mmHg. The mean absolute differences of changes in IOP at various time intervals ranged from 0.63 to 1.14 mmHg and the proportion were 18.18 - 44.16% at 10%, 15.58 - 28.57% at 15%, and 3.90 - 7.79% at 2 mmHg. The value of biometry, demographic features and individual factors had no association with IOP profiles except two significant results including significant higher mean absolute differences between the fellow eyes in male and height greater than 160 cm.

Conclusion: The diurnal IOP of normal individuals fluctuates symmetrically between the fellow eyes. Although asymmetric IOP and its fluctuation existed at any given cut off values, the overall amount of difference in IOP profiles was 1 mmHg which has been recognized as acceptable error by Goldman applanation tonometer from previous studies. The significant association of absolute IOP differences between fellow eyes with male sex and greater height may be due to the differences in cooperation and posture stability at the IOP measurements.
**P255**

**EFFECT OF BIOMECHANICAL PROPERTIES OF THE CORNEA ON INTRAOCULAR PRESSURE MEASUREMENT**

I. Lienheová  
Department of Ophthalmology, Masaryk’s Hospital, Ústí nad Labem, Czech Republic

Purpose: To estimate the relationships between biomechanical properties of the cornea and tonometrically measured intraocular pressure (IOP) during the diurnal period of time.

Methods: Three hundred eyes from 50 patients with open angle glaucoma (OAG), 50 patients with ocular hypertension (OH) and 50 patients with optic nerve suspect were included. Measurements of IOP and corneal hysteresis (CH) were taken at 7:00 AM, 13:00 and 19:00 PM.

Results: During the diurnal period, IOP was higher in the morning among all subjects and decreased progressively. Corneal hysteresis was relatively constant during the day. The mean IOP at 6:30 was 24.4 mmHg and CH 18.4 mmHg, at 13:00 IOP was 20.8 mmHg and CH 17.9 mmHg at 19:00 IOP was 21.9 mmHg and CH 18.0 mmHg in the group of OH patients. The mean IOP at 6:30 was 18.2 mmHg and CH 11.2 mmHg at 13:00 IOP was 15.8 mmHg and CH 11.9 mmHg at 19:00 IOP was 16.9 mmHg and CH 12.6 mmHg in the group of optic nerve suspect patients. The mean IOP at 6:30 was 19.2 mmHg and CH 11.4 mmHg, at 13:00 IOP was 17.8 mmHg and CH 12.1 mmHg at 19:00 IOP was 17.1 mmHg and CH 11.6 mmHg in the group of OAG patients.

Conclusion: We conclude that there is no evidence that a change of IOP is significantly associated with a change in biomechanical properties of cornea.

**P256**

**APPLANATION Tonometry INTRACULAR PRESSURE MEASUREMENTS COMPARED TO AIR PULSE Tonometry (NT-3000, NIDEIK), BEFORE AND AFTER TOPICAL OXYBUPROCAINE (0.4%) INSTILLATION**

R. Nacouzi  
Ophthalmology Department, CH, Le Mans, France

Purpose: To compare applanation tonometry (AT) to air pulse tonometry (APT), and to study the effect of oxybuprocaine (0.4%) on intraocular pressure (IOP) measured by APT.

Methods: It is a prospective, randomized, double blind study, with 200 patients. The patients are randomly selected from a list of patients consulting a general ophthalmological clinic. After verifying inclusion and exclusion criterias, right and left eye of each patient are randomized into two groups. One eye receives a drop of Oxybuprocaine (0.4%), whereas the other eye receives a drop of placebo, all in a double blind fashion. IOP is measured by APT, three times in each eye, before and then minutes after drop instillation. The right eye is systematically measured before the left eye. IOP by AT, and pachymetry, is then measured after oxybuprocaine (0.4%) instillation in both eyes.

Results: 135 patients are included in the study. Mean age is 50.6 ± 15.1 years. Sex ratio is 0.95. Oxybuprocaine is instilled in 48.1% of right eyes and in 51.9% of left eyes. Mean IOP measured by APT, before eye drops instillation, is 16.41 ± 3.7 mmHg. Mean IOP measured by APT, after placebo instillation, is 15.8 ± 3.9 mmHg. Mean IOP measured by APT after oxybuprocaine instillation is 15.13 ± 3.4 mmHg. Mean IOP measured by AT is 13.89 ± 3.1 mmHg.

Conclusions: This is the first report of an in-vivo wireless continuous monitoring of the corneo-scleral deformation induced by the IOP decrease on five glaucomatous patients. Further clinical tests are ongoing to characterize the dependence of the CLS signal amplitude on biometric and biomechanical eye properties. This device potentially allows minimally invasive continuous measurement of relative changes in IOP, during prolonged periods, regardless of patient activity. It can thus, for example, replace the 24-hour IOP curve.

**P258**

**CORRELATING DIFFERENCES IN GOLDMANN APPLANATION TONOMETRY AND DYNAMIC CONTOUR TONOMETRY READINGS WITH CORNEAL MORPHOMETRY IN HEALTHY SUBJECTS**

F. Saenz-Francés, J.M. Martinez-de-la-Casa, C. Mendez-Hernandez, A. Fernandez-Vidal, N. Diez-Bienvenido, J. Garcia-Sanchez, J. Garcia-Feijoo  
Hospital Clinico Universitario San Carlos, Madrid, Spain

Objective: To determine whether differences exist between pressure measurements obtained by Goldmann applanation tonometry (GAT) and dynamic contour tonometry (DCT) in healthy subjects and, if so, to establish whether these differences are related to the individual morphometric characteristics of the cornea.

Methods: Intraocular pressure (IOP) was determined in 88 eyes of 44 normal subjects by GAT and DCT. Measurements of the ocular pulsation were also recorded and compared to Dynamic Contour Tonometer.

Results: The CLS was perfectly tolerated and a slit-lamp exam after the measurement was normal. The filtered CLS signal is well correlated in time and amplitude with the IOP decrease measured by Goldmann tonometry. The ocular pulsation is well demonstrated and comparable to the signal obtained by DCT.

Conclusions: This is the first report of an in-vivo wireless continuous monitoring of the corneo-scleral deformation induced by the IOP decrease on five glaucomatous patients. Further clinical tests are ongoing to characterize the dependence of the CLS signal amplitude on biometric and biomechanical eye properties. This device potentially allows minimally invasive continuous measurement of relative changes in IOP, during prolonged periods, regardless of patient activity. It can thus, for example, replace the 24-hour IOP curve.
(power and orientation of the flattest and steepest corneal axes) were also determined. Agreement between GAT and DCT readings was assessed by determining interclass coefficients of correlation (ICC) and contracting Bland Altman plots. The influence on GAT/DCT differences of the morphometric features of the cornea was analyzed through multivariable regression.

Results: Agreement between GAT and DCT was moderate (ICC 0.51; p < 0.0001). Bland Altman plots revealed that for the lower IOPs, DCT tends to overestimate pressures compared to GAT, while for higher IOPs the two sets of measurements show fairly close agreement. Multivariable regression indicated that only the factors age and steepest corneal axis orientation affected the difference between the two tonometry methods.

Conclusions: Agreement between IOPs determined by GAT or DCT in normal subjects is only moderate. Discrepancies between readings are greater for the lower pressures, with DCT tending to overestimate pressures compared to GAT. The differences recorded between the two sets of IOP measurements were only affected by subject age and orientation of the steepest corneal axis.

**P259**

**COMPARISON OF OCULAR PULSE AMPLITUDE VALUES DETERMINED BY PASCAL DYNAMIC CONTOUR TONOMETRY IN PRIMARY OPEN ANGLE GLAUCOMA, OCULAR HYPERTENSION AND NORMAL TENSION GLAUCOMA**

T. Takmaz, I. Can
Atatürk Training and Research Hospital, 2nd Ophthalmology Department, Ankara, Turkey

Purpose: To compare intraocular pressure (IOP) and ocular pulse amplitude (OPA) values determined by Pascal dynamic contour tonometry in primary open angle glaucoma (POAG), ocular hypertension (OH), normal tension glaucoma (NTG) and normal eyes, and evaluate relationship between OPA and glaucoma type.

Methods: 120 eyes of 120 patients (30 patients in each of the following 4 groups; POAG, OH, NTG and normal subjects) were included in this prospective non-randomized study. In each group IOP and OPA values were determined by Pascal dynamic contour tonometer and differences between the groups were investigated. Measurements with quality scores 1 or 2 were included in the study. Presence of correlation between OPA and IOP or central corneal thickness were also evaluated.

Results: There was not difference between the groups according to sex (p = 0.578). Mean age was different (p = 0.001), and POAG patients (69.1 ± 10.7 years) were older than OH (59.5 ± 7.1 years) and NTG (55.2 ± 8.2 years) patients (p = 0.001). Corneal thickness was also different (p = 0.001), where, it was thicker in OH (567.9 ± 19.3 µm) (p = 0.001) than the other groups and thinner in NTG (530.3 ± 13.1 µm) (p = 0.001). There was also difference between the groups according to IOP (p = 0.001), IOP was higher in OH (21.3 ± 2.3 mmHg) (p = 0.001), and lower in NTG (15.7 ± 1.4 mmHg) patients (p=0.001). When OPA values were evaluated, it was seen that there was significant difference between the groups (p=0.001), and OPA was significantly higher in OH patients (4.1 ± 0.8 mmHg) (p = 0.001). Statistically significant correlation was not seen between OPA and IOP or central corneal thickness in each group (p > 0.05).

Conclusions: OPA was significantly higher in patients with OH where IOP was also higher, but there was not correlation between OPA and IOP or central corneal thickness.

**P259**

**INFLUENCE OF CENTRAL CORNEAL THICKNESS ON THE INTRAOCULAR PRESSURE BEFORE AND AFTER PHACOTRABECULECTOMY IN PATIENTS WITH CATARACT AND GLAUCOMA**

M. Zoric Geber, Z. Mandic, K. Novak Laus, J. Korsic
University Department of Ophthalmology, Clinical Hospital “Sestre Milosrdnice”, Zagreb, Croatia

Purpose: To analyse an influence of the central corneal thickness (CCT) on the intraocular pressure (IOP) before and after phacotrabeculectomy in patients with cataract and glaucoma. Patients and methods: The study included 18 patients with cataract and glaucoma without any previous surgical interventions on the eye. Pre and postoperative evaluation included determination of the best corrected visual acuity, Goldmann applanation tonometry (GAT), central corneal thickness measurements by pocket II pachymeter, gonioscopy, slit-lamp biomicroscopy with cataract grading using the grading scales of the lens opacities classification system LOCS III. Postoperative controls were first day and than after 10 days. Each patient underwent a combined operative procedure at two site (“V”) approach: cataract on the superior temporal part, 11 o’clock on the right eye and 1 o’clock on the left eye and trabeculectomy on the 11 o’clock on the right eye and 1 o’clock on the left eye. Patients with intraoperative complications were excluded from the study.

Results: Postoperative central corneal thickness was significantly higher than preoperative one. Pre operative mean CCT was 541 (SD 35.1) µm, p < 0.001 whereas postoperative mean CCT was: first day 700.8 (SD 168.6) µm, p < 0.001 and 10-th day 613.4 (SD 97.3 p < 0.001). The mean CCT at 10th postoperative day was significantly lower than mean CCT at first postoperative day (p = 0.003).

Conclusion: The results of this study indicate that higher postoperative CCT could influence the intraocular pressure measurement by Goldmann application tonometry. The study suggests that postoperative CCT should be taken in consideration when setting a target pressure after combined surgery because of the adequate postoperative management of glaucoma patients.

**P260**

**LONG-TERM CHANGES IN CCT VALUES IN PATIENTS SUFFERING FROM PRIMARY OPEN ANGLE GLAUCOMA, EXFOLIATIVE GLAUCOMA AND OCULAR HYPERTENSION**

P. Zotta, E. Kanonidou, N. Mylopoulos, A.G.P. Konstas
1 th Department of Ophthalmology, AHEPA Hospital, Aristotle University of Thessaloniki, Greece

Introduction: Extensive research has been undertaken in order to prove that Central Corneal Pachymetry (CCT) consists an independent risk factor for the development and process of ocular hypertension in patients suffering from primary open angle glaucoma (POAG), especially in patients with thin corneas. Besides, in accordance with the derived intraocular pressure (IOP) measurements with the use of application tonometers, IOP values in patients with CCT values less than 550µm are underestimated resulting in a non-preferable pressure reduction and finally in an increased rate of damage progression.

Purpose: The aim of the study was to investigate whether there is an in-time change in CCT values in eyes suffering from primary open angle glaucoma (POAG), exfoliative glaucoma (EXG) and ocular hypertension (OH).

Methods: A retrospective study was undertaken in which CCT was conducted with the use of ultrasounds and the medians
of two consecutive measurements of each patient at two different point times were evaluated by the same investigator. The variables under investigation were the following: a) CCT changes in eyes in relation to their treatment modalities b) whether there were CCT changes in eyes with untreated OH and c) whether there were CCT changes in eyes with POAG or EXG surgically treated pre- and post-operatively. 260 eyes (142 patients) participated in the study, 100 (55 patients) of which were suffering from POAG, 80 (46 patients) from EXG and 80 (41 patients) from OH with a mean follow up period of 43.6 months (9-72 months).

Results: In eyes under medical treatment, there was a 94.3% (n = 67/71) decrease in CCT values in patients suffering from POAG, a 68.9% (n = 24/37) decrease in patients with EXG and a 83.3% (n = 19/22) decrease in patients with OH. On contrary, in eyes who underwent glaucoma surgical therapy and paused medical treatment postoperatively, there was an 86.2% (n = 25/29) increase in patients suffering from POAG and a 74.4% (32/43) increase in those suffering from EXG.

Conclusions: The results indicate that after a mean follow up of 43.6 months:

Poster Session 28
TRABECULAR MESHWORK SURGERY, INCLUDING LASER AND GLAUCOMA SURGERY

P263
EFFICACY OF SELECTIVE TRABECULOPLASTY IN THE TREATMENT OF PRIMARY OPEN-ANGLE GLAUCOMA
N. Collignon, L. Crevecoeur, S. Guillaume, O. Trabelski, J. Thys, M. Hua, J. Collignon, J.M. Rakic
University Hospital of Liège, Belgium

Background/aims: Since selective laser trabeculoplasty (SLT) produces significantly less disturbance to the trabecular meshwork and more safety, it has potential to replace argon laser trabeculoplasty (ALT) as the standard procedure to treat open angle glaucoma. Since SLT has been found to have a better success rate when performed the 360 degrees of the trabecular meshwork compared to 180 degrees, we investigate the outcomes of 360° selective laser trabeculoplasty (SLT) in the treatment of primary open-angle glaucoma.

Methods: In a non-randomized, prospective clinical study, 80 patients (104 eyes) with progressive POAG or/and medically uncontrolled intraocular pressure underwent SLT. A total of 100 ± 5 adjacent but non overlapping spots were placed over the 360 degrees of the trabecular meshwork using a 532 nm, Q-switched, Nd:Yag laser at energy levels ranging from 0.5-1.0 mJ per pulse. After SLT, the hypotensive medication during the study period remained unchanged. All patients were observed before and 1 hour, 3 and 6 months after the treatment. Thirty eight of them completed the 12 months follow-up period. Successful SLT defined as having a SLT induced intraocular pressure (IOP) reduction of > or = 20% at any post-treatment follow up.

Results: The average pre-operative IOP was (19.5 ± 7) mmHg. The mean IOP reduction from baseline were 3.5 mmHg (20.7%), 3.9 mmHg (21.3%) 3 months after the SLT, 3.2 mmHg (18.6%) 6 months after the SLT, 2.2 mmHg (14.6%) 12 months after the SLT. Adverse reactions were minimal, including conjunctival injection, mild anterior chamber reaction, and transient pressure spike. In one eye, reversible corneal edema was observed.

Conclusion: SLT is an effective method to lower IOP in POAG patients. Regards to its safety profile, SLT may be a repeatable therapy option for patients who escape its effect with time.

P264
SELECTIVE LASER TRABECULOPLASTY (SLT) IN THE TREATMENT OF EXFOLIATION GLAUCOMA (EXF)
E. Conte, F. Lelario, V. Russo, A. Stella, S. De Gennaro, K. Giannouli, N. Delle Noci
Department of Ophthalmology, University of Foggia, Italy

Background: Exfoliation glaucoma (EXF) is a rare, non-penetrating form of glaucoma. Selective laser trabeculoplasty (SLT) produces significantly less disturbance to the trabecular meshwork and more safety, it has potential to replace argon laser trabeculoplasty (ALT) as the standard procedure to treat open angle glaucoma. Since SLT has been found to have a better success rate when performed the 360 degrees of the trabecular meshwork compared to 180 degrees, we investigate the outcomes of 360° selective laser trabeculoplasty (SLT) in the treatment of primary open-angle glaucoma.

Methods: In a non-randomized, prospective clinical study, 80 patients (104 eyes) with progressive POAG or/and medically uncontrolled intraocular pressure underwent SLT. A total of 100 ± 5 adjacent but non overlapping spots were placed over the 360 degrees of the trabecular meshwork using a 532 nm, Q-switched, Nd:Yag laser at energy levels ranging from 0.5-1.0 mJ per pulse. After SLT, the hypotensive medication during the study period remained unchanged. All patients were observed before and 1 hour, 3 and 6 months after the treatment. Thirty eight of them completed the 12 months follow-up period. Successful SLT defined as having a SLT induced intraocular pressure (IOP) reduction of > or = 20% at any post-treatment follow up.

Results: The average pre-operative IOP was (19.5 ± 7) mmHg. The mean IOP reduction from baseline were 3.5 mmHg (20.7%), 3.9 mmHg (21.3%) 3 months after the SLT, 3.2 mmHg (18.6%) 6 months after the SLT, 2.2 mmHg (14.6%) 12 months after the SLT. Adverse reactions were minimal, including conjunctival injection, mild anterior chamber reaction, and transient pressure spike. In one eye, reversible corneal edema was observed.

Conclusion: SLT is an effective method to lower IOP in POAG patients. Regards to its safety profile, SLT may be a repeatable therapy option for patients who escape its effect with time.

Poster Session 27
TRABECULAR MESHWORK

P262
NITRIC OXIDE IN GLAUCOMA
C. Stefan1, D. Melinte Dumitrica1, C. Ardeleanu2
1 Central Military Emergency Hospital Carol Davila, Bucharest, Romania
2 Victor Babes Institute, Immunohistochemistry Department, Romania

Introduction: Nitric oxide (NO) is an important intra and extra molecular messenger, implicated in vasodilatation, contractility, neurotransmission, neurotoxicity and inflammation. NO is formed from L-arginine by nitric oxide synthase (NOS). Nitric oxide synthase has three isoforms: NOS-1 neuronal, NOS-2 inducible and NOS-3 endothelial (vasodilatation effect). Nitric oxide has a demonstrate role in many neurodegenerative diseases like: glaucoma, Alzheimer disease, multiple sclerosis and cerebral-cardio-vascular diseases.

Purpose: To investigate the presence, the localisation and the distribution of the NOS by immunohistochemistry in patients with primary open angle glaucoma (POAG).

Methods: Observational, prospective, clinical study, during 12 months on one group of 15 patients with POAG that have underwent filtering surgery – trabeculectomy. The fragments of trabecular meshwork prelevated during surgery were studied by immunohistochemistry for NOS using EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.

Results and conclusions: After laboratory analyses in patients of the beginning of the study were any ocular or general pathology associated.

EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.

EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.

EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.

EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.

EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.

EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.

EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.

EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.

EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.

EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.

EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.

EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.

EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.

EnVision indirect polymeric method. The exclusion criteria at the beginning of the study were any ocular or general pathology associated.
Purpose: The comparative response of exfoliation (EXF) glaucoma and primary open-angle glaucoma (POAG) to selective laser trabeculoplasty (SLT) was a prospective, non-randomized pilot study.

Methods: The effectiveness of Nd:YAG laser trabeculoplasty (SLT) was compared in 20 eyes of patients with EXF glaucoma (uncontrollable by maximally tolerated medical therapy) and 24 eyes of patients with POAG (controls); this analysis was performed at the Department of Ophthalmology in Foggia (Italy) from Dec 2004 to Feb 2007. All POAG and EXF patients were white. 60% of the POAG group and 40% of the EXF glaucoma group received treatment of the entire angle in two divided sessions in order to reduce the intraocular pressure (IOP) to less than or equal to 18 mmHg. All second treatments were performed at least four to six weeks after the initial session. IOP was measured before and 1 day, 1 week, 1 month, 12 months and 24 months.

Results: The mean ± SD IOP decreased from 25 ± 3 mmHg to 16.9 ± 2 mmHg soon after treatment and reached 21 mmHg and above after 2 years from the beginning of the treatment in EXF group. Evaluation of the postoperative course of IOP by means of the Kaplan-Meier curve for data analysis indicated that EXF patients “failed” at a faster rate than POAG patients after both the initial and consecutive laser treatments. The rate of failure in the EXF group, however, was greater following the initial overall treatment.

Conclusions: Although patients with EXF glaucoma have a large initial reduction in intraocular pressure after SLT, to increase the probability of maintaining intraocular pressures of less than or equal to 18 mmHg, this therapy should be used in conjunction to others to obtain better and longer results. In fact, from our analysis SLT proved effective in the first months following the therapy, dramatically reducing the intraocular pressure, but, in the long time, its efficacy tends to greatly decrease.

**P265**

**MICROPULSE™ DIODE LASER (810 NM) VERSUS ARGON LASER TRABECULOPLASTY IN THE TREATMENT OF OPEN-ANGLE GLAUCOMA: COMPARATIVE SHORT AND MEDIUM-TERM SAFETY PROFILE AND INTRAOCULAR PRESSURE LOWERING EFFECT**

M. Detry-Morel, F. Muschart, S. Pourjavan
St. Luc University Hospital, Université Catholique de Louvain, Brussels

Purpose: Prospective, comparative, randomised study aiming at assessing the safety and the IOP lowering effect of Micropulse™ diode laser trabeculoplasty (810nm) (MDLT) and argon laser trabeculoplasty in patients with open angle glaucoma.

Methods: 26 patients (mean age = 67 years) were randomly assigned to undergo either MDLT (16 eyes) (66 applications, 100 msec, 0.6 mJ/pulse, 300 µm) or ALT (15 eyes) over 180°. In 5 patients, MDLT was done in one eye and ALT in the other eye. Patients were followed for early IOP spikes and anterior segment inflammation. IOP was recorded at 1 day, 1 week, 1 and 3 months and 3 month intervals thereafter.

Results: Both groups were well-matched for age, glaucoma type, previous laser or surgical procedure, pre-treatment meds. Mean follow-up was 5.2 ± 1.7 months for MDLT and 5.5 ± 2.3 in ALT (p > 0.05). Mean pre-treatment IOP was 20.7 ± 3.8 mmHg and 21.64 ± .2 mmHg in ALT respectively (p > 0.05). Mean IOP was significantly reduced compared to the pre-treatment level in both groups at the different visits (p < 0.05). Mean final IOP was not significantly different in MDLT (19.2 ± 4.6 mmHg) and ALT (17.2 ± 3.6 mmHg) (p = 0.21). The mean percentage of IOP reduction was 19.6% and 12.9% in ALT and MDLT respectively. Number of meds was comparable in MDLT (2.3 ± 0.9) and ALT (2.8 ± 0.7) at the last visit (p = 0.06). MDLT was uneventful in 100% of patients with no thermal pain and no uncomfortable laser flashes. Anterior segment inflammation was absent or mild in both procedures. MDLT was associated with early moderate IOP spike in one eye with POAG.

Conclusion: MDLT appeared to induce a short and medium-term IOP reduction perceptibly smaller than ALT. It induced minimal anterior segment inflammation and seemed to exhibit a good safety profile. Although its IOP efficacy should be still confirmed on a larger sample size and by modifying the treatment parameters, its potential selective thermal interaction with trabecular pigmented cells has to be considered in the therapeutical decision.

**P266**

**FIRST RESULTS OF SELECTIVE LASER TRABECULOPLASTY (SLT) IN CROATIA**

G. Morena, M. Bohac, N. Gabric, I. Dekaris
Svjetlost Clinic, Croatia

Aim: To present our first results of Selective Laser Trabecuoplasty (SLT) in treatment of open angle glaucoma (OAG).

Methods: This is a retrospective study which is based on three months follow-up of patients with open angle glaucoma who have undergone the SLT treatment. Patients are of different age and sex and have different types of open angle glaucoma (Primary open angle glaucoma - POAG, Pigment Glaucoma, Pseudoexpholiative Glaucoma - PEX Glaucoma), and ocular hypertension. The treatment was performed with Ellex Solo Nd Yag Ophthalmic Laser (Model LTS106 - S). The laser procedure is performed in standard fashion in all cases. The size of laser spot was 400 µm. The initial power setting between 0.6 mJ and 1.0 mJ was selected and the energy was subsequently titrated (0.4 – 1.2 mJ) until the desired „bubbles” were seen. The procedure was then completed for 180 degrees (either nasal or temporal side of trabeculum). The intended number of spots was between 40 and 60.

Results: 66 eyes of 63 patients were treated with SLT. Main measurement in our follow-up study was intraocular pressure (IOP). All eyes exhibited a decrease of IOP after the treatment for > 1 mmHg and 98.6% of eyes continued to show a lowered levels of IOP for 2 weeks after the treatment. All those eyes stayed in between preferable levels of IOP for three more months. In 4 eyes of 4 patients (2.64% of total number of participants) IOP has elevated in average of 1 - 2 mmHg in 8 weeks, but it stayed in preferable levels of IOP for the next three months. In 2 eyes of 2 patients (1.32 % of total number of participants) IOP has elevated above the preferable levels 9 weeks after the treatment. In both cases patients have had the diagnosis of PEX Glaucoma. Those two patients have undergone the retreatment.

Conclusion: Our first experiences with the SLT show that SLT is safe and effective procedure in lowering the IOP for some time and is also safe two use in retreatment. The procedure is quick and painless so it is suitable for the patient.

**P267**

**CLINICAL RESULTS COMPARING SELECTIVE LASER TRABECULOPLASTY TO TITANIUM: SAPPHIRE LASER TRABECULOPLASTY FOR PRIMARY OPEN ANGLE GLAUCOMA**

M. Goldenfeld, S. Melamed
The Sam Rothberg Glaucoma Center, Goldschleger Eye Institute, Sheba Medical Ctr, Tel Hashomer, Israel

Purpose: To compare the clinical findings following selective laser trabeculoplasty (SLT) and Titanium:Sapphire laser tra-
ANIMAL MODEL FOR TRABECULAR SURGERY

R.L. Merté1, G. Wexel1, W. Assmann2, K. Weick3, R. Sroka3, R. Korbel4
1 Augenklinik der TU München, 2 Beschleunigerlabor LMU München, 3 Laserforschungs labor LMU München, 4 Vogelklinik der LMU München, Germany

Background: Trabecular surgery is gaining more widespread interest. Animal models for this type of surgery are scarce except for primates. Primates are rare and expensive to use. Therefore an easier model would be preferable.

Methods: The use of ostrich eyes as model for trabecular surgery is investigated.

Results: Ostrich eyes are roughly twice as big as human eyes, and their anatomy allows for ample space in the anterior chamber. Therefore an easier model would be preferable.

Conclusion: In this trial TLT was demonstrated to be comparable to SLT at reducing intraocular pressure and incidence rate of complication.

P268

TRABECULAR MICRO-BYPASS STENT IN PATIENTS WITH OAG AND CATARACT EXTRACTION: 18 MONTH RESULTS

J. Martinez-de-la Casa1, J. Feijoo1, J. Sanchez1, G.S.G. GC-002 Study Group2
1 Inst Ramon Castroviejo University, 2 GC-002 Study Group, Spain

Purpose: To evaluate the safety and efficacy of a trabecular micro-bypass stent (iStent, Glaukos Corp.) in patients undergoing concurrent cataract and glaucoma surgery.

Methods: Prospective, open-labeled, 24-month, multi-country evaluation of 48 patients with uncontrolled primary OAG and cataract. Patients underwent clear cornea phacoemulsification followed by gonioscopically ab-interno implantation of the iStent. Ocular hypotensive (OH) medications were discontinued on the day of surgery. Results for the 41 patients who completed 18 months of follow-up are included. Primary outcomes: IOP reduction, OH medication reduction.

Results: At baseline, mean (± SD) IOP was 21.9 ± 3.98 mmHg on maximum tolerated therapy. At 18 months, mean IOP was 16.9 ± 3.24 mmHg, a 21.4% decrease (P < 0.0001). At baseline, patients were taking a mean 1.6 ± 0.8 medications, by month 18 that had been reduced to 0.4 ± 0.6 (P < 0.0001). At month 18, more than half the patients achieved an IOP ≤ 18 mmHg without requiring OH medications. The most commonly reported device-related adverse events were the appearance of stent lumen obstruction (7 eyes) and stent malposition (9 eyes) for which most of these patients most still achieved significant IOP and medication reduction. None of the adverse events were considered serious.

Conclusions: The implantation of the iStent is safe and efficacious for reducing IOP in OAG patients and can significantly reduce or eliminate the number of glaucoma medications.

P270

INTRAOCULAR PRESSURE RESPONSE TO SELECTIVE LASER TRABECULOPLASTY IN PRIMARY, SECONDARY AND REFRACTORY GLAUCOMA

C. Méndez-Hernández1, J. García-Feijoó1, A. Fernández-Vidal1, F. Saenz-Françés2, J.M. Martínez-de-la-Casa3, R. García-Catalán2, C. Fernández1, J. García-Sánchez1
1 MD PhD, 2 MD, Spain

Objective: To evaluate the effectiveness of Selective Laser Trabeculoplasty (SLT) in primary, secondary and refractory glaucoma.

Methods: A retrospective chart review was performed on 101 eyes of patients treated with SLT between December 2005 and December 2007. Two-tailed paired t-test was used to compare maximum pre and post-procedure IOP and number of pre and post-procedure glaucoma medications.

Results: 101 eyes were treated with SLT: 54 had primary open angle glaucoma (POAG), 11 pseudoexfoliative glaucoma, one asymmetric glaucoma, one corticosteroid-induced glaucoma, one traumatic glaucoma, 7 pseudophakic glaucoma, 4 aphakic glaucoma, and 22 had refractory glaucoma. Patients were divided according to their probability of success in two groups: group 1 had patients with most probability of success and group 2 had patients with least probability of success (pseudophakic, aphakic, traumatic and refractory glaucomas). 22 eyes received SLT as repeat treatment; these patients had either a previous poor response to argon laser trabeculoplasty (ALT) or SLT, (10 eyes) or a prior failed filtration surgery and were on maximum tolerable glaucoma medications without IOP control (12 eyes, refractory glaucoma group). The IOP decreased from a mean of 21.59 mmHg ± 3.5 to 18.78 mmHg ± 3.8. Absolute IOP decrease was 2.82 mmHg (95% CI: 1.93-3.70), which represents an 11.41% of relative reduction (95% CI: 7.55-15.25) and was significant with a p-value < 0.001. The number of glaucoma medications decreased from a mean of 1.84 ± 0.833 to 1.38 ± 0.81 which represents a 21.7% reduction in the number of medications (95% CI:13.78-29.62). The results were significant with a p-value < 0.001.

Results: Were similar for both groups: absolute IOP decrease of 2.81 mmHg (95% CI: 1.71-3.91), p < 0.001 for group 1 and 2.83 mmHg (95% CI: 1.29-4.38) for group 2 (p = 0.001), which represents a 10.94% (95% CI: 5.98-15.89) and 12.13% (95% CI: 5.73-18.54) of reduction, and a reduction of 32.13% (95% CI: 21.84-42.40) in the total number of medications in group 1 and 5.13% (95% CI: -5.83-16) in
group 2. In the refractory glaucoma group the IOP decreased a 12.76% (95% CI: 2.83-22.69) and the number of glaucoma medications reduced a 6.82% (95% CI: -0.59-22.23).

Conclusion: In this study, SLT significantly lowered intraocular pressure and the number of medications needed to control IOP, even in refractory glaucomas with either prior SLT/ALT treatment or filtration surgery.

P271

MICROPULSE™ DIODE LASER TRABECULOPLASTY (MDLT) VersUS ARGON LASER TRABECULOPLASTY (ALT) IN THE TREATMENT OF OPEN-ANGLE GLAUCOMA: COMPARATIVE SHORT AND MEDIUM-TERM SAFETY PROFILE AND IOP EFFICACY

M. Detry-Morel, F. Muschart, S. Pourjavan
St. Luc University Hospital, Université Catholique de Louvain, Brussels, Belgium

Purpose: Prospective, comparative, randomized study aiming at assessing the safety and the IOP lowering effect after Micropulse Diode Laser Trabeculoplasty (810 nm) (MDLT) and Argon Laser Trabeculoplasty (ALT) in glaucomatous patients.

Methods: 26 patients (mean age: 67 years) (31 eyes) were randomly assigned to undergo either MDLT (16 eyes) (66 applications, 100 ms, 0.6mJ/pulse, 300 µm) or ALT (15 eyes) over 180°. In 5 patients, MDLT was done in one eye and ALT in the other eye. Patients were followed for early IOP spikes and anterior segment inflammation. IOP was recorded at 1 day, 1 week, 1, 3 and 3 months and 3 month intervals thereafter.

Results: Both groups were well-matched for age, glaucoma type, previous laser or surgical procedure, pre-treatment meds. Mean follow-up was 5.2 ± 1.7 months for MDLT and 5.5 ± 2.3 in ALT (p > 0.05). Mean pre-treatment IOP was 20.7 ± 3.8 mmHg and 21.6 ± 4.2 in MDLT and ALT respectively (p > 0.05). Mean IOP was significantly reduced compared to the pre-treatment level in both groups at the different visits (p Anterior segment inflammation was absent or mild in both procedures. MDLT was associated with early moderate IOP spike in one eye with POAG.

Conclusion: MDLT appeared to induce a short and medium-term IOP reduction comparable although slightly lower than ALT. It induced minimal anterior segment inflammation and seemed to exhibit a good safety profile. Its potential selective thermal interaction with trabecular pigmented cells has to be considered in the therapeutical decision.

P272

MULTIPHOTON IMAGING FOR VISUALIZATION AND ABLATION OF THE TRABECULAR MESHWORK - A NEW APPROACH TO GLAUCOMA SURGERY

P. Pogorelov1, U. Schlötzker-Schrehardt1, E. Chankiewitz2, M. Pollhammer1, I. Riemann2, C. Hammer3, E. Lütjen-Drecoll4, E. Kruse1
1 Department of Ophthalmology, University of Erlangen-Nuremberg, Erlangen, Germany; 2 Fraunhofer Institute of Biomedical Technology (IBMT), St. Ingbert, Germany; 3 Institute of Anatomy, University of Erlangen-Nuremberg, Erlangen, Germany

Purpose: Currently, filtering surgery is limited by scarring and trabecular surgery which should allow for reduction of outflow resistance is lacking appropriate instrumentation. Multiphoton imaging combines diagnosis on a cellular level with the option of ablation in the micron range. We explored the potential application of multiphoton imaging for visualization and simultaneous ablation of trabecular tissue for non-invasive glaucoma surgery.

Materials and methods: A compact solid-state mode-locked 90 MHz Ti: sapphire femtosecond laser with a wide wavelength range 715-930 nm and 140 fs pulse duration, connected to a laser scanning microscope Zeiss Axiovert 510-Meta was used to visualize and ablate trabecular meshwork and anterior segment tissues in anaesthetized mice and rabbits. Autofluorescent cellular structures were imaged at 750 nm incident wavelength, whereas extracellular collagen fibers were visualized at 850 nm. The images were collected in both tangential and sagittal levels using an 20 x 0.9 objective at 2 µm z-steps. For intratissue ablation, the mean laser power was enhanced to about 210mW. After imaging and ablation, animals were killed and the eyes were enucleated for histological analysis.

Results: Optical sections were obtained from corneal, scleral, and chamber angle tissues. Multiphoton imaging provided high-resolution images of cornea, limbus and sclera at cellular level. The trabecular meshwork (TM) was identified through the sclera, avoiding opening of the eye. After femtosecond laser power enhancement, highly precise intratissue ablation within the trabecular meshwork was performed. Histology confirmed not only the nature of the cellular images obtained by multiphoton imaging, but also the absence of detectable collateral damage adjacent to the ablation in the TM.

Conclusion: In vivo multiphoton-autofluorescence imaging and ablation by femtosecond laser pulses within TM is possible ab externo, and may prove to be a clinically applicable novel option for non-destructive trabecular surgery.

P273

SELECTIVE LASER TRABECULOPLASTY (SLT) FOR THE OPEN ANGLE GLAUCOMA (OAG): RESULTS AND EFFICACY OVER A 4 & 1/2-YEAR PERIOD

F. Ferrentini, A. Porta, F. Romanazzi
Eye Unit, C. Cantú Hospital, Abbiategrasso, Milan, Italy

Purpose: To examine safety, efficacy and tonometric outcomes of selective laser trabeculoplasty (SLT) for patients with open angle glaucoma; considerations regarding successes and failures thank to visual field analysis. 20% IOP reduction from initial values is our goal.

Method: We collected the results at 1 week, 1, 3, 6, 12, 18, 24, 30, 36, 42, 48 and 54 months postoperatively. We treated 118 eyes affected by open angle glaucoma; considerations regarding successes and failures thank to visual field analysis. 20% IOP reduction from initial values is our goal.

Results: 118 eyes with known OAG diagnosis had a mean pre-operative IOP of 19.2 (SD 3.2) mmHg (range 22-32). Of these, 85 eyes maintained the requested inclusion criteria at 24, 30, 36, 42, 48 and 54 months postoperatively. The total IOP average was 14.56 mmHg: -25.49% from the baseline IOP value (p < 0.001). Regarding the single groups: the IOP average was 14.9 (SD 2.71) mmHg for the eyes preserving the same therapy after SLT and 53 reduced their medical treatments. Statistical analysis is performed through t-Student test for paired data.

Results: 118 eyes with known OAG diagnosis had a mean pre-operative IOP of 19.2 (SD 3.2) mmHg (range 22-32). Of these, 85 eyes maintained the requested inclusion criteria at the last follow-up time: 23 eyes were excluded for post-SLT surgery, 10 were lost during follow-up. The total IOP average is 14.56 mmHg. -25.49% from the baseline IOP value (p < 0.001). Regarding the single groups: the IOP average was 14.9 (SD 2.71) mmHg for the eyes preserving the same therapy and 14.37 (SD 2.58) for the eyes that changed their medical treatments. The 12 eyes with recent diagnosis had a preoperative IOP average of 24.16 (SD 3.9) mmHg, after 54 months, it was 15.3 (SD 1.6) mmHg, (p = NA), on 10 eyes: 2 excluded for post-SLT surgery.

Conclusions: SLT proved to be a safe, effective and non invasive procedure, able to lower IOP delaying or avoiding surgery; it can be considered useful in replacing or adding the medical therapies improving patients’ quality of life. This procedure seems that when used in eyes with recent diagnosis of glaucoma, to be more effective than in the eyes medically treated before, but further works should be done to prove this peculiarity.
Eye with postoperative IOP > 21 mmHg with medication un-
group 31.8 ± 4.5 mmHg and in III group: 31 ± 4.5 mmHg.
Preoperatively mean IOP in I group was 28 ± 3.5 mmHg, in II
0.45 ± 0.17, in II group: 0.5 ± -0.16, in III group: 0.6 ± 0.2.
TTH. Corneal diameter in the I group / 15 eyes / was 11 to
months / with congenital glaucoma divided in three groups
Methods: A total of 65 eyes of 40 children / mean age 9 ± 7
stages of congenital glaucoma.
Results: Visualization of the angle structures with both types
for ab interno goniotomy.
Visualization of the angle was assessed using the Trabectome system for
preoperative IOP > 21 mmHg with medication un-
postoperative IOP > 21 mmHg with medication un-
models decrease the risk of infectious disease transmission risk and may be used
multiple times. The model in this study was tested using the
Trabectome but would also be suitable for other techniques
for angle surgery. In addition to allowing excellent visualization
of gonioscopy lenses was excellent with detail comparable to
in vivo assessment through a clear cornea. Ablation of the TM
by the Trabectome handpiece could be carried out easily un-
der an operating microscope, comparable to in vivo surgery.
Tactile feedback upon engaging the meshwork is minimal in this
procedure, but similar in the model compared with in vi-
vo surgery. After an area of TM had been used, the model
eyes could be rotated 90-180° to allow visualization of the
untreated TM.
Conclusions: The surgical teaching model and technique de-
scribed in this study represents a novel method for practicing
angle surgery. In addition to allowing excellent visualization of
angle structures, fixative-treated eye models decrease the
Rigid contact lenses 8.5 mm in diameter were affixed
to the corneal rim using cyanoacrylate glue. The anterior
chamber was filled with viscoelastic through a paracentesis port.
The entire eye was then immersed in 10% buffered for-
malin for a minimum of 48 hours. Visualization of the angle
was assessed using a Sussman 4-mirror handheld gonioscopy lens and a modified Swann-Jacobs gonioscopy lens. Suitability
for angle surgery was assessed using the Trabectome system for
ab interno goniotomy.
Results: Visualization of the angle structures with both types of
gonioscopy lenses was excellent with detail comparable to in
vivo assessment through a clear cornea. Ablation of the TM by
the Trabectome handpiece could be carried out easily un-
der an operating microscope, comparable to in vivo surgery.
Tactile feedback upon engaging the meshwork is minimal in this
procedure, but similar in the model compared with in vivo
surgery. After an area of TM had been used, the model eyes
could be rotated 90-180° to allow visualization of the
untreated TM.
Conclusions: The surgical teaching model and technique described in this study represents a novel method for practicing angle surgery. In addition to allowing excellent visualization of angle structures, fixative-treated eye models decrease the risk of infectious disease transmission risk and may be used multiple times. The model in this study was tested using the Trabectome but would also be suitable for other techniques including goniometry or laser trabecuoplasty.

P274
A PRACTICE MODEL FOR TRABECULAR MESHWORK SURGERY
A. Sit, S. Patel
Department of Ophthalmology, Mayo Clinic College of Medicine, Rochester, USA

Purpose: Models for practicing ophthalmic surgery involving the trabecular meshwork (TM) have not been satisfactory. Animal models such as porcine eyes are not suitable due to the anatomic differences between primate and non-primate angles. Human cadaver eyes may be used but have limited visualization of the angle due to post-mortem corneal edema. There are also concerns about the potential for disease transmission since human tissue obtained for teaching purposes is typically not tested for potentially communicable diseases. The purpose of this study was to develop and test a novel, safe teaching model for angle surgery.

Methods: Human cadaveric eyes not suitable for transplant were obtained from a regional Eye Bank. A hand-held trephine was used to remove a 7.5-8.0mm central corneal button. Rigid contact lenses 8.5 mm in diameter were affixed to the corneal rim using cyanoacrylate glue. The anterior chamber was filled with viscoelastic through a paracentesis port. The entire eye was then immersed in 10% buffered formalin for a minimum of 48 hours. Visualization of the angle was assessed using a Sussman 4-mirror handheld gonioscopy lens and a modified Swann-Jacobs gonioscopy lens. Suitability for angle surgery was assessed using the Trabectome system for ab interno goniotomy.

Results: Visualization of the angle structures with both types of gonioscopy lenses was excellent with detail comparable to in vivo assessment through a clear cornea. Ablation of the TM by the Trabectome handpiece could be carried out easily under an operating microscope, comparable to in vivo surgery. Tactile feedback upon engaging the meshwork is minimal in this procedure, but similar in the model compared with in vivo surgery. After an area of TM had been used, the model eyes could be rotated 90-180° to allow visualization of the untreated TM.

Conclusions: The surgical teaching model and technique described in this study represents a novel method for practicing angle surgery. In addition to allowing excellent visualization of angle structures, fixative-treated eye models decrease the risk of infectious disease transmission risk and may be used multiple times. The model in this study was tested using the Trabectome but would also be suitable for other techniques including goniometry or laser trabecuoplasty.

P275
TRABECULOTOMY IN DIFFERENT STAGES OF CONGENITAL GLAUCOMA
N. Vlahova-Petkova
University Eye Clinic, Alexandrovska Hospital, Sofia, Bulgaria

Purpose: To compare efficacy and postoperative results of Trabeculotomy after Harms/TTH/, in children in different stages of congenital glaucoma.

Methods: A total of 65 eyes of 40 children / mean age 9 ± 7 months / with congenital glaucoma divided in three groups according to corneal diameter and cup/disc ratio underwent TTH. Corneal diameter in the I group / 15 eyes / was 11 to 12.5 mm; in II group / 44 eyes /: 13-14.5 mm and in III group / 6 eyes /: 15-16 mm. Cup/ disc ratio in I group was: 0.45 ± 0.17, in II group: 0.5 ± 0.16, in III group: 0.6 ± 0.2. Preoperatively mean IOP in I group was 28 ± 3.5 mmHg, in II group 31.8 ± 4.5 mmHg and in III group: 31 ± 4.5 mmHg. Eyes with postoperative IOP > 21 mmHg with medication un-
derwent a second TTH or TTH + trabeculectomy / TE / with mitomycin C / MMC / single or combined with TTH. Results of the different groups were compared. Follow-up period up to 7 years.

Results: Most children were in II group. Mean IOP after sur-
ery in I group was 17.0 ± 3.4 mmHg, in II group 17.0 ± 3.5 mmHg and in III group 19 ± 7 mmHg. Success rate after TTH /IOP < 21 mmHg without medication / was achieved in 77% in I group, 73 % in II group and 30% in III group / tbl.2 /.

Most unsuccessful cases who needed additional surgical treat-
ment were in II group with > corneal size /14 - 14.5 mm / 27% / and in III group / 67% /.

They underwent additional surgical treatment. Main postoperative complications were: transitory shallow anterior chamber in 5% in II group and 30% in III group, and hyphaema in about 20% in I and II and 40% in III group, postsurgical cataract -1 eye in II group.

Conclusions: Congenital glaucoma is discovered most often when buphthalmos is apparent. TTH could be a first line treatment in all cases but success rate is lower and complications increase in more advanced stages and corneas larger than 14 mm diameter. Combined procedures or additional TE with MMC could improve the results in most advanced cases.

P276
A CASE OF IDIOPATHIC CHOROIDAL EFFUSION TREATED WITH NON PENETRATING SCLERECTOMY
A. Corral Martinez, L. Guerrero Altares, L. Cabrejas Martinez, F. Muñoz Negrete
Hospital Ramon y Cajal Madrid, Spain

Purpose: To report a case of idiopathic choroidal effusion treated with non-penetrating sclerectomy.

Case: We present the case of a 55 year-old woman who came with decreased visual acuity in her left eye (20/200), dilated episcleral vessels and an intraocular pressure (IOP) of 38 mmHg. She had a cup/disc ratio of 0.9 and choroidal folds in the superior temporal quadrant of her left eye. After discarding other etiologies such as tumors or arteriovenous fistula, the patient was diagnosed with idiopathic glaucoma due to high episcleral venous pressure. Due to the lack of response to the medical treatment it was performed non penetrating deep sclerectomy. 24 hours after surgery IOP was 26 mmHg and the anterior chamber was swallowed with peripheric iridoendotelial contact. Funduscopic exam showed a non hem-
orrhagic superotemporal choroidal detachment. The patient was treated with cicloplegic, topical and sistemic steroids and timolol-brimonidine eyedrops. On the two-week follow-up visit the IOP had been controlled even though there were some choroidal folds. Four months after surgery all the choroidal folds had disappeared and the IOP was 21mmHg free of treatment.

Conclusion: Glaucoma due to high episcleral venous pressure is generally considered difficult to control with medical treatments and the conventional filtering surgery is associated with risk of choroidal effusions and haemorrhage. The non penetrating deep sclerectomy produces a more controlled fil-
tering and therefore has less risk in developing an uveal effu-
sion syndrome after surgical procedure than trabeculectomy. In spite of this, in the present case a local detachment hap-
pened, though disappeared with time.

www.eugs.org
P277
GOLD MICRO-SHUNT FOR SUPRACHOROIDAL FILTRATION, INITIAL CASE SERIES
V. De Groot, M.J. Tassignon
University Hospital Antwerp, Belgium

Introduction: A new glaucoma implant was introduced by Gabriel Simon, MD, PhD, aiming at filtration into the suprachoroidal space and avoiding all bleb related failures and complications. An initial case series is now reported by a surgeon having no financial interest.

Methods: A prospective consecutive case series. The Micro Gold Shunt with internal channels of 40 microns was implanted in 5 patients (4 with COAG and 1 with OHT) with high intraocular pressure (IOP) under maximal tolerated medication. They had no previous glaucoma surgery. Mean outcome measures were IOP and UBM findings.

Results: Surgery was uneventful and quick. The implant had a nice positioning in the anterior chamber and drained fluid to the suprachoroidal space at 1 week, as was confirmed by UBM. Postoperative hypotony was moderate and almost gone at one month. After 3 to 5 months 2 patients were controlled without medication (IOP decrease of 55% and 22%) and 3 patients had a big IOP increase at 1 month, which responded to the same topical medications they were using before (IOP decrease of 18, 26 and 48%).

Conclusion: Due to a quick surgical procedure with a low risk profile, all patients were borderline controlled, although 3 of the 5 patients needed additional medications. The initial good filtration diminished strongly after one month in those 3 patients. Overall IOP decrease with the current design is however much less compared to a trabeculectomy.

P278
RESULTS OF “COMBINED CYCLECTOMY/TRABECULECTOMY” COMPARED WITH AHMED VALVE IMPLANT IN NEOVASCULAR GLAUCOMA CASES
G. Engin1, K.N. Engin2, C. Yilmazli3
1 Gelisim Hospital, Department of Ophthalmology Istanbul, Turkey, 2 Bagcilar Education and Research Hospital, Department of Ophthalmology Istanbul, Turkey, 3 Vakif Gureba Education and Research Hospital, Department of Ophthalmology Istanbul, Turkey

Purpose: Cyclectomy/trabeculectomy is a modified trabeculectomy operation particularly suggested for refractory glaucomas. Ahmed valve surgery, on the other hand, is the most preferred seton operation for this patient group. Neovascular glaucoma has the lowest success rates with conventional and seton operations among the other refractory glaucomas. In this study, we have evaluated the patient outcomes that we have observed with these two techniques, in patients with neovascular glaucoma.

Methods: Thirtyfive eyes with neovascular glaucomas have been enrolled. Nine of the patients were male (52.94%). Median age was 55 years (range 19-81 years). Neovascular glaucoma diagnoses were: PCAG in 4 cases (23.53%), neovascular in 4 (23.53), traumatic and postsurgical in 2 (11.76), congenital, inflammatory, pseudoxofilation and ICES one case each (5.88). Median time from surgery was 15 months (range 1-58). Median IOP was 14 mmHg (3-46). Median anterior chamber depth was 2.33 mm (1.48-3.38), Sp1 0.8 mm (0-2.23), Sp2 1.35 mm (0-3.41), Th1 1.04 mm (0.57-1.62), Th2 1.13 mm (0.65-2.01). The bleb wall was thicker at its anterior part: Th1: 1.04 mm (0.57-1.62), and Th2: 1.13 mm (0.65-2.01). The bleb wall was thicker at its anterior apex of the plate (Th1), thickness of bleb wall at a site corresponding to the intermediate, transversal ridge of the plate (Sp2), thickness of bleb wall at central anterior apex of the plate (Sp1), plate to capsule distance from the intermediate, transversal ridge of the plate (Th2).

Results: Seventeen patients have been enrolled. Nine of the patients were male (52.94%). Median age was 55 years (range 19-81 years). Neovascular glaucoma diagnoses were: PCAG in 4 cases (23.53%), neovascular in 4 (23.53), traumatic and postsurgical in 2 (11.76), congenital, inflammatory, pseudoxofilation and ICES one case each (5.88). Median time from surgery was 15 months (range 1-58). Median IOP was 14 mmHg (3-46). Median anterior chamber depth was 2.33 mm (1.48-3.38), Sp1 0.8 mm (0-2.23), Sp2 1.35 mm (0-3.41), Th1 1.04 mm (0.57-1.62), Th2 1.13 mm (0.65-2.01). The bleb wall was thicker at its anterior part: Th1: 1.04 mm (0.57-1.62), and Th2: 1.13 mm (0.65-2.01) (p = 0.031). Four patients had no filtering space above the plate (Sp1 and Sp2 values of 0). Their IOPs were 4, 10, 14 and 46 mmHg. There was a tendency in these cases to have thicker capsular-conjuntival walls than in the ones with a filtering space although it was not statistically significant (p = 0.08 and p = 0.10 for Th1 and Th2 respectively). No relationship was found in this small series between height of the bleb and IOP.

Conclusions: a) UBM imaging and measuring of the plate and the bleb area are possible in most cases, b) the bleb wall was thicker at its anterior part, c) absence of an aqueous chamber above the plate may not necessarily correspond with an elevated IOP, d) a tendency towards thicker bleb walls was found in cases with no such space. The conclusions of this report need to be rechecked as further recruitment increases the population size of this ongoing study.

P279
WHAT ABOUT THEM PLATES? AN IN VIVO UBM STUDY OF THE PLATE AREA IN AHMED S-2 GLAUCOMA VALVES (PRELIMINARY REPORT)
D. Grigera, V. Krochik
Hospital Oftalmológico Santa Lucía, Buenos Aires, Argentina

Purpose: to study by means of ultrasound biomicroscopy structures in the filtration area in patients who underwent glaucoma drainage device (GDD) implantation (Ahmed S-2 valve).

Methods design: prospective case series. Consecutive patients attending their regular controls between October and December 2007 were included. Patients in which UBM scans of the filtration area were not feasible, or having clinical or local conditions that rendered the procedure non-advisable were excluded. Measurements with the in-built caliper were made. Main outcome measures: IOP, central anterior chamber depth, plate to capsule distance from the intermediate, transversal ridge of the plate (Sp2), thickness of bleb wall at central anterior apex of the plate (Th1), thickness of bleb wall at a site corresponding to the intermediate, transversal ridge of the plate (Th2).

Results: Fifteen patients have been enrolled. Nine of the patients were male (52.94%). Median age was 55 years (range 19-81 years). Neovascular glaucoma diagnoses were: PCAG in 4 cases (23.53%), neovascular in 4 (23.53), traumatic and postsurgical in 2 (11.76), congenital, inflammatory, pseudoxofilation and ICES one case each (5.88). Median time from surgery was 15 months (range 1-58). Median IOP was 14 mmHg (3-46). Median anterior chamber depth was 2.33 mm (1.48-3.38), Sp1 0.8 mm (0-2.23), Sp2 1.35 mm (0-3.41), Th1 1.04 mm (0.57-1.62), Th2 1.13 mm (0.65-2.01). The bleb wall was thicker at its anterior part: Th1: 1.04 mm (0.57-1.62), and Th2: 1.13 mm (0.65-2.01). Four patients had no filtering space above the plate (Sp1 and Sp2 values of 0). Their IOPs were 4, 10, 14 and 46 mmHg. There was a tendency in these cases to have thicker capsular-conjuntival walls than in the ones with a filtering space although it was not statistically significant (p = 0.08 and p = 0.10 for Th1 and Th2 respectively). No relationship was found in this small series between height of the bleb and IOP.

Conclusions: a) UBM imaging and measuring of the plate and the bleb area are possible in most cases, b) the bleb wall was thicker at its anterior part, c) absence of an aqueous chamber above the plate may not necessarily correspond with an elevated IOP, d) a tendency towards thicker bleb walls was found in cases with no such space. The conclusions of this report need to be rechecked as further recruitment increases the population size of this ongoing study.
P280
EARLY COMPLICATIONS OF P KHAWS MOORFIELDS TRABECULECTOMY
D. Gruber
Clinique du Petit Colmoulins, Le Havre, France

Purpose: to evaluate the incidence of complications within the first 3 post-operative months after P Khaw’s Moorfields Trabeculectomy.

Methods: In this retrospective consecutive case study 110 eyes of 89 patients underwent trabeculectomy according to P Khaw’s protocol by the same surgeon from September 2004 to September 2007. 71 eyes had POAG, 22 eyes CACG, 17 eyes other types of glaucoma. In 27 cases this was a second or third filtering procedure. Antimetabolites were used in all but one eye (5FU; 11; MMC; 98). All patients were followed at least 3 months. Since May 2005 the protocol of the conjunctival suture was changed in order to reduce the incidence of wound leakage: 2 limbal knots buried in short corneal incisions were systematically added to the 2 usual lateral purse-string knots. The criteria for success at 3 months were defined as an IOP less than 16mmHg without treatment. For statistical analysis the chi-square test was used. A value of p < 0.05 was considered significant.

Results: The complications were hyphaema (n = 9; 10%), hypotony (n = 5; 4.5%), shallow anterior chamber (n = 3; 2.7%), wound leak (n = 20; 18.2%), choroidal detachment (n = 5; 4.5%), endophthalmitis (n = 1; 0.69%). From the 36 eyes (32.7%) who developed at least one of these complications, 11 (30.6%) were tonometric failure at 3 months. This failure rate was significantly different from that of the 74 eyes without postoperative complication (9 tonometric failure: 12.2%). Wound leakage was frequent during the early study period (till May 2005): 6/16: 37.5%. The incidence dropped with the modified conjunctival suture technique: 14/94: 14.9%. This was a statistically significant difference.

Conclusion: P Khaw’s Moorfields Trabeculectomy is a safe procedure. Nonpenetrating Deep Sclerectomy is not the only safe filtering procedure.

P281
THE EFFECT OF NEEDLE REVISION WITH HIGH DOSE OF MITOMYCIN C
S. Hyung1, K.J. Woo1, C.S. Kim2, J. Moon3, K.R. Choi4, J.H. Lee5, N. Baek6
1 Chungbuk Nat’l Univ. Hospital, Korea, 2 Chungnam Nat’l Univ. Hospital, Korea, 3 St. Mary’s Hospital The Catholic Univ. of Korea, 4 Ewha Womans Univ. Mokdong Hospital, Korea, 5 Sanggye Paik Hospital, Inje Univ., Korea

Purpose: To investigate the efficacy and the complications of 0.1 mg/ml mitomycin C (MMC) augmented needle revision (NR) on failed filtering blebs.

Methods: Thirty eyes whose intraocular pressure (IOP) did not decrease after scleral flap suture lysis were recruited. NR was performed with a 26-gauge needle under a slit-lamp. Immediately after NR, all eyes received subconjunctival injection of 0.1ml of 0.02 mg/ml (group A) or 0.1 mg/ml (group B) MMC at the adjacent conjunctiva. Mean follow-up period after the last needle revision was 13.5 ± 6.0 months.

Results: The mean IOP decreased from 25.7 ± 10.6 mmHg before NR to 13.7 ± 2.5 mmHg at the last follow-up in the group A, and from 24.1 ± 6.8 mmHg to 18.9 ± 9.2 mmHg in the group B. In 26 eyes (86.7%), the last IOP was less than or equal to 18 mmHg. Subconjunctival hemorrhage, hyphema and shallow anterior chamber were appeared in most cases. But choroidal detachment (1 patient) and avascular change of conjunctiva (2 patients) were occurred only in the group B.

Conclusions: NR followed by subconjunctival injection of 0.1 ml of 0.1 rather than 0.02 mg/ml MMC is too high to use in NR for reformation of the failed filtering blebs after trabeculectomy.

P282
A COMPARISON OF THE INTRAOCULAR PRESSURE-LOWERING EFFECT OF ADJUSTABLE SUTURE VS. LASER SUTURE LYSIS FOR TRABECULECTOMY
H. Kobayashi1, K. Kobayashi2
1 Department of Ophthalmology, Kokura Memorial Hospital, 2 Department of Ophthalmology, Kurashiki Central Hospital, Japan

Purpose: To compare the intraocular pressure-lowering effect of adjustable sutures and laser suture lysis for trabeculectomy in eyes with primary open-angle glaucoma.

Methods: Fifty patients with primary open-angle glaucoma were studied. Eyes were assigned randomly to either trabeculectomy augmented with mitomycin C with adjustable sutures or that with laser suture lysis. Twenty-five patients under went trabeculectomy with adjustable sutures, and 25 patients underwent that with laser suture lysis. Patients were followed-up for 12 months and success rate based on intraocular pressure was compared. Adjustable sutures were carried out as reported by Khaw et al. 

Results: Mean baseline intraocular pressure was 27.8 ± 2.8 mmHg in the adjustable suture group and 27.3 ± 2.9 mmHg in the laser suture lysis group (p = 0.9). Mean postoperative intraocular pressure was 11.5 ± 2.0 mmHg at 3 months, 11.7 ± 3.2 mmHg at 6 months, and 12.2 ± 3.4 mmHg at 12 months in the adjustable suture group and 12.1 ± 2.6 mmHg at 3 months, 13.1 ± 4.7 mmHg at 6 months, and 13.4 ± 3.5 mmHg at 12 months in the laser suture lysis group. Mean intraocular pressure in the adjustable group was lower compared with the laser suture lysis group; there was no significant difference at any time point. At 12 months, 24 patients (96%) in the adjustable suture group and 23 patients (92%) in the laser suture lysis group achieved an intraocular pressure of less than or equal to 20 mmHg without medication (p = 0.9). Reduced depth of the anterior chamber was found in no patient in the adjustable suture group and 5 patients in the laser suture lysis group after loosening of the adjustable sutures or laser suture lysis (p = 0.0251).

Conclusions: There was no significant difference in hypotensive efficacy between the adjustable suture group and the laser suture lysis group. The use of adjustable sutures may reduce the incidence of shallow anterior chamber and hypotony after postoperative IOP-lowering procedures.

P283
TRABECTOME (TRABECULECTOMY; INTERNAL APPROACH) FOR OPEN-ANGLE GLAUCOMA
D. Minckler1, L. Dustin2, S. Mosaedi3, B. Francis3
1 University of California, Irvine, 2 University of Southern California, Los Angeles, USA

Purpose: Present outcomes from Trabectome for open-angle glaucomas.

Methods: This device permits an internal approach to trabeculectomy via a 1.6 mm clear corneal incision. Unique device features include a ceramic coated footplate inserted under gonioscopic control into Schlemm’s. An electro-
Results: These data include 584 Trabectome-only and 214 combined Trabectome-phacoemulsification operations. Among Trabectome-only eyes, the mean preoperative IOP was 25.3 mmHg and the mean % decrease in IOP 35% at two-years to 16.5 mmHg (n = 30). Failure with subsequent glaucoma surgery (repeat Trabectome, laser trabeculoplasty, trabeculectomy, aqueous shunt installation, cyclophotocoagulation) occurred in 76/584 (13%). The cumulative probability of failure at 12 months among 81 patients with at least one-year follow-up was 33.8% (IOP > 21 or not reduced by 20% below baseline on two consecutive visits after 3 months). Complications included transient reflux bleeding from Schlemm’s and collector channels in 73% but no prolonged hypotony, choroidal effusion, choroidal hemorrhage or infections. IOP spikes postoperatively have been minimal if viscoelastic is thoroughly removed. Adjunctive medication use decreased in Trabectome-only cases from a mean preoperative number of 2.9 to 0.93 by 24 months. Among combined phaco-Trabectome eyes the mean base-line IOP was 19.6 mmHg and the mean decrease at 12 months was 24% to 14.9 mmHg (n = 10). Adjunctive medications decreased by 29% from a preoperative mean of 2.2 to a one-year mean of 1.55 (n = 24).

Conclusions: Trabectome surgery alone or combined with cataract extraction offers a minimally invasive method of improving IOP control and decreasing the need for adjunctive medications. An ARVO presentation is planned.

P284
SHORT-TERM EFFICACY AND SAFETY OF SUPRACHOROIDAL SHUNT IN PATIENTS WITH PREVIOUSLY FAILED FILTERING GLAUCOMA SURGERY
G. Olea Zorita, J. Garcia Feijoo, J.M. Martinez de la Casa, A. Fernandez Vidal, C. Mendez Hernandez, F. Saenz-Frances San Baldomero, J. Garcia Sanchez
Hospital Clínico San Carlos, Madrid

Purpose: To evaluate the hypotensive efficacy and safety of suprachoroidal shunt in patients with previously failed glaucoma surgery.

Methods: Prospective study in 13 eyes of 13 patients with primary open-angle glaucoma (POAG), maximum medical therapy and at least one failed filtering surgery.

Results: Mean preoperative intraocular pressure (IOP) was 21.7 ± 4.5 mmHg. Mean preoperative glaucoma medications was 2.8 ± 0.8. 3 patients were treated with oral acetazolamide before surgery. Mean filtering glaucoma surgeries prior to shunt implantation was 1.4 ± 0.8. Within the follow-up, mean IOP was 14.36 ± 6.62 at 1 week (p 0.007), 18.15 ± 5.74 at 1 month (p 0.70), 19.62 ± 5.37 at 3 months (p 0.33), and 18.45 ± 3.23 at 6 months (p 0.05). At 6 months, mean glaucoma medications was 1.27 ± 1.1 (p 0.011). 4 patients remained without treatment 6 months after surgery and 0 patients needed oral acetazolamide. We achieved 15.32% decrease in IOP (p 0.05) and 54.48% decrease in medications (p 0.011) 6 months after shunt implantation. No significant complications were noted during surgery or follow-up.

Conclusions: Suprachoroidal shunt allows, in short term, to control IOP in patients with refractory glaucoma, decreasing significantly requirements for topical glaucoma therapy.

P285
IOP REDUCTION IN OAG PATIENTS UTILIZING TRABECULAR BYPASS SURGERY WITH GOLD SHUNT IMPLANT (SOLX, INC., WALTHAM, MASSACHUSETTS)
A. Porta1, P. Romanazzi1, F. Ferentini1
1 Eye Unit, C. Cantù Hospital, Abbiategrasso, Milan, Italy

Purpose: To achieve IOP reduction utilizing the Uveal-Scleral Outflow pathway with the Solx Gold Shunt (Model: GMS+).

Method: Four-4 patients with OAG underwent Trabecular bypass surgery with Gold Shunt implantation utilizing two different surgical techniques. The first subset of two patients underwent implantation by utilizing a 5 x 5 mm initial scleral flap, followed by two vertical scleral incision parallel to the limbus; the first incision at 1.5 mm and forming a scleral tunnel into the AC and the second at 4mm from the limbus exposing the suprachoroidal space. The flap is then positioned through the two incisions to facilitate communication between the AC and the suprachoroidal space. The flap is tightly sutured, insuring the wound is water tight. The second subset underwent a single scleral incision located 3 mm from the limbus and to a length of 3-4 mm. A scleral tunnel is formed toward the AC at a depth of 90% total scleral thickness followed by exposure of the suprachoroidal space. The shunt is inserted through a single incision and the flap is manipulated posteriorly into the suprachoroidal space. The scleral incision is tightly sutured insuring it is water tight. Throughout the follow-up period we performed OCT Visante to verify proper shunt placement and increased uveal-scleral outflow.

Results: the IOP was 8.5 mmHg (range 3-17) at two-2 months and the 15.72 mmHg (range 13-17.5) at one-year postoperatively. Short term complications included transient hyphema and two-2 post-operative micro blebs. Late term complications included two small iris synechiae between the iris and shunt without affecting the performance of the device and one device explantation secondary to traumatic dislocation. Pharmaceutical therapy in the remaining three subjects was reduced from 3 agents pre-operatively to 1 agent post-operatively to achieve absolute IOP.

Conclusions: Our experience with the Gold Shunt showed a satisfactory result in the surgical treatment of OAG, a high safety profile when compared to other surgical options currently available and a fast and easy surgical technique.
filtering blebs appeared diffuse and ischaemic. No postoperative conjunctival injection or ocular inflammation was noticed. No other complications were recorded.

Conclusion: Bevacizumab seems to be an additive effective tool for prevention of postoperative glaucoma bleb failure. Further studies are recommended.

P287

THE FILTERING, CLEAR-CORNEA DIATHERMAL KERATO STOMY. A DANISH MULTICENTER STUDY: SHORT-TERM RESULTS

J. Thygesen, S.V. Kessing, O. Nissen, P. Flesner, N. Otland, P. Riise

The Glaucoma Clinic, Dept. of Ophthalmology, Rigshospitalet, University of Copenhagen, Denmark. 

Department, Roskilde Hospital, Denmark. 

Eye Department, Odense University Hospital, Denmark

Purpose: To investigate if the micropenetrating, clear-cornea procedure, the Intrastromal Diathermal Keratostomy (IDK) has the potential to be an alternative to traditional filtering procedures judged from the initial IDK results of four experienced Danish Eye departments.

Methods: Each of the four glaucoma surgeons had to attend a scheduled theoretical and practical IDK course and to decide when to start their consecutive IDK patient registration. A photocopy of each patient file was sent to a central registration centre for analysis. Subconjunctival injection of preoperative, individual Mitomycin C doses were recommended according to a scheme both in primary and secondary surgery and at low and high risk-of-failure. A total of 54 eyes (48 patients) with advanced glaucoma (cup/disc ratio ≥ 0.8) in 63% were studied. New IOP success criteria (IOP ≤ 15 mmHg and ≥ 30% IOP decrease) were employed for this group and traditional (IOP ≤ 18 mmHg and 30% decrease) for moderate glaucoma (cup/disc ratio ≤ 0.7).

Results: The preoperative mean IOP was 29 mmHg and after 10 months for the successful eyes 10 ± 2.5 mmHg in the advanced group and 13 ± 2.5 mmHg in the moderate group. The success rate was 76% and 80%, without medication in 71% and 60%. Results of the most experienced surgeon (33 operations) compared with less experienced (≤ 11 operations per surgeon) showed the same total success rate and number of risk-of-failure factors per eye, but significantly more postoperative IOP lowering procedures for the less experienced surgeons. The “knife time” for the most experienced surgeon averaged 15 minutes (range: 10 to 20 min). The success rate after IDK revision with internal needling through the original corneo-scleral tunnel incision was 69%. No intraoperative complications were registered and no serious postoperative except from 1 case of visual impairment after hypotension maculopathy.

Conclusion: The short-term results of the minimal invasive MMC IDK, carried out by different surgeons, are promising. IDK seems to be easier and quicker than traditional filtering procedures and revision with internal needling is easy and efficient. Thus the MMC IDK may be a valid alternative and may also be recommended after failed trabeculectomy, replacing shunting. Randomized, controlled studies are indicated.

P288

TWO YEARS RESULTS AFTER TRABECUECTOMY PERFORMED ON PATIENTS WITH POAG AND PEXG

A. Tischler Smitran, J. Björkcr

Department of Ophthalmology of the Södra Älvsborgs Hospital in Borås, Sweden

Purpose: To analyze retrospectively the results of trabeculectomies (TE) performed on patients with primary open angle (POAG) and with pseudoexfoliative glaucoma (PEXG), on the Department of Ophthalmology of the Södra Älvsborgs Hospital in Borås, Sweden. 1 surgeon performed the surgeries during 2003-2005.

Methods: We studied 113 eyes of 103 patients, 78 with PEXG and 35 POAG. Follow up time was 2 years. Trabeculectomies were performed on using a 2 mm x 4 mm scleral flap with two or more adjustable 10-0 nylon sutures under a fornix-based conjunctival flap. Intraoperatively the scleral flap sutures were tied tightly to avoid postoperative hypotony. 27 trabeculectomies were augmented with antimitabolite intraoperatively (Mitomycin 0.2 mg/ml, 5 minutes expositions time), Depending on the postoperative intraocular pressure (IOP) removes the adjustable sutures one by one.

Results: Preoperatively mean IOP was 28.5 mmHg (PEXG: 31.33 POAG: 28.37). Mean IOP 1 year after surgery 15.91 mmHg (PEXG: 16.19 POAG: 15.48) Mean IOP 2 years after surgery 16.29 mmHg (PEXG: 16.59 POAG: 15.00). Mean number of antiglaucoma medication preoperatively 3.1 (PEXG: 2.95 POAG: 3.02). 1 year after surgery 0.52 ( PEXG: 0.64 POAG:0.32). 2 years after surgery 0.85 (PEXG: 0.91 POAG: 0.68).

Conclusions: Postoperatively mean IOP and numbers of antiglaucoma agents was significantly decreased in both groups of glaucoma patient even after 2 years follow-up. Trabeculectomy is as effective treatment for POAG as PEXG in case of failed drug treatment.
Conclusions: Both surgical techniques in non-perforating deep sclerectomy (NPDS) with application of Mitomycin C or 5-FU seem to give similar clinical results. However, more postoperative complications were observed in the limbus-based conjunctival flap group. It appears that the rate of cystic bleb formation is rather related to the application of an antimetabolite than to the type of conjunctival flap in non-perforating deep sclerectomy.

**P290**

**TRABECULECTOMY WITH MITOMYCIN-C VS. TRABECULECTOMY WITH OCULUS GEN**

N. Mylopoulos, P. Zotta

1st Department of Ophthalmology, AXEPA Hospital, Aristotle University of Thessaloniki, Greece

Introduction: Tenon’s fibroblast-mediated subconjunctival scar formation is an important cause of Trabeculectomy (TRC) failure. Mitomycin-C has a potent inhibitory effect on the scarring response reducing postoperative scar formation. Oculus Gen is a collagen matrix implant with a similar to mitomycin-C effect which allows normal healing and prevents the collapse of the subconjunctival space after TRC.

Purpose: To compare the effect of mitomycin-C vs Oculus Gen on wound healing formation after glaucoma filtration surgery.

Design: Prospective interventional two treatment group randomized clinical trial.

Methods: TRC with a fornix based conjunctival flap was carried out by the same surgeon on consecutive patients with uncontrolled advanced open angle glaucoma requiring filtering surgery with antimetabolite. Patients were randomized to either TRC with 0.1mg/ml of mitomycin-C for 3 min (Group A) or TRC with Oculus Gen (Group B). In Group A there were 15 males and 15 females (30 patients-30 eyes) with mean age 73 years and in Group B there were 17 males and 13 females (30 patients-30 eyes) with mean age 76 years. Main outcomes measures included change in intraocular pressure (IOP) at one year follow-up, compared to preoperative values and occurrence of intraoperative and postoperative complications. Complications were defined as following: hyphema, flat anterior chamber, encapsulated bleb, choroidal, corneal complications and hypotony maculopathy. Complete success was defined as an IOP of < 18 mmHg without medications and qualified success as an IOP of < 18 mmHg with antiglaucoma medications.

Results: The IOP at one year postoperatively was < 18 mmHg without treatment in 93% of patients (28/30) in Group A vs 77% of patients (23/30) in Group B, p = 0.14.

Conclusions: TRC with Oculus Gen offers a relatively safe and effective technique in patients with uncontrolled advanced glaucoma. TRC with intraoperative mitomycin-C achieves lower IOP values but there always a risk of more severe postoperative complications.

**P291**

**COMPLIANCE WITH TREATMENT AMONG GLAUCOMA PATIENTS IN LITHUANIA**

A. Butkiene

Eye Clinic of Kaunas University of Medicine, Kaunas, Lithuania

Purposes: To estimate the level of patients adherence to glaucoma treatment and the influence of this treatment on patients quality of life (QOL).

Method: 200 patients on topical glaucoma treatment were asked to fill the questionnaire concerning compliance and their QoL. 171 questionnaires were fully completed and analyzed.

Results: The mean age was 69 years. 79% of patients answered that they always put their eye drops in time, 19% sometimes miss the dose and only 2% admitted that they miss the dose frequently. 89% of patients put in their eye drops by themselves. 77% of patients on one medication and 67% using two different drugs never forget to put in their eye drops. The prescribed daily frequency of eye drops was associated with noncompliance: missed doses reported 20% of those with once - daily dosing, 22% with twice - daily, 39% with three - times daily and 50% with multiple - daily dosing (4 or more times daily). 77% of respondents answered, that glaucoma treatment has no influence to their QoL, though it depends on frequency of dosing: 85% of patients with once - daily dosing feel no impairment of QoL, however 78% with twice - daily and only 66% with multiple - daily dosing (3 or more times daily) feel no influence to their QoL. 15% of patients on one medication and 35% using two different drugs indicated that glaucoma treatment reduces their QoL.

Conclusions: Once - daily dosing increase patient compliance and has less influence to the quality of life. Multiple - daily dosing of glaucoma medication reduce patients compliance and worsen quality of life.

**P292**

**VALUE OF DRIVING FOR PATIENTS WITH GLAUCOMA: WILLINGNESS TO PAY**

T. Bramley1, J. Walt2, R. Carlton3

1 Xcenda, Salt Lake City, UT, USA, 2 Xcenda, Palm Harbor, FL, USA

Purpose: The loss of driving privileges is one of greatest losses of personal independence suffered by glaucoma patients. This loss of independence has a significant impact on personal, social, and economic well-being. As a consequence, any intervention or pharmaceutical agent that can either preserve or extend an individuals visual acuity would be highly valued. The purpose of this study was to assess the willingness to pay to maintain driving privileges in patients with glaucoma.

Methods: A mailed survey assessing glaucoma severity, current driving status and willingness to pay for additional years of driving privileges was sent to a random sample of 5000 individuals. A contingent valuation scenario was posed to individuals as “Your physician tells you that there is a treatment available for glaucoma that will increase your chances to see for a longer period of time, and thus maintain your ability to drive independently. However, the treatment is not covered by your insurer. If you had to make a decision today, what is the maximum amount you would be willing to pay for the treatment in order to maintain driving privileges for one more year?”

Results: A total of 2009 individuals completed the survey for a 40% response rate. The majority of the responders were women (70%) and the mean age of the population was 60.5 (SD = 16.5) years. Over 60% of individuals rated their glaucoma as mild and 73% of individuals reported that they still drive. Approximately 43% of responders replied that they would pay up to $ 50000 for one additional year of driving privileges.

Conclusions: Driving privileges and personal independence are highly valued by individuals as they age. In order to maintain their driving privileges and personal independence, older individuals with glaucoma are willing to pay a sizeable amount of money to improve visual acuity.
OUTCOMES
SAFETY, EFFICACY AND PATIENT REPORTED OUTCOMES
M. Dirks1, J. Walt2
1 Blackhills Regional Eye Institute, Rapid City, SD, USA, 2 Allergan, Inc., Irvine, CA, USA

Purpose: To compare the efficacy, tolerability, and patient satisfaction associated with use of bimatoprost 0.03%, latanoprost 0.005%, or travoprost 0.004% as first- or second-line monotherapy during the first 12 months of treatment.

Methods: Patients (N = 1099 from 41 centers) with primary open-angle glaucoma (POAG) or ocular hypertension (OHT) were enrolled in this 1-year prospective, naturalistic, randomized, investigator-masked, observational study, and treated with bimatoprost, latanoprost, or travoprost. Expected adverse events such as hyperemia, unexpected adverse events, and patient-reported outcomes were captured using an Internet-based registry.

Results: To date, 288 patients returned for a follow-up visit 1 year after initiation of treatment. Expected adverse events were reported by 15.9% of latanoprost patients 15.0% of bimatoprost patients, and 11.1% of travoprost patients (p = .0651). Physician-reported incidence of hyperemia was similar for bimatoprost, travoprost, and latanoprost: 41.1%, 40.4%, and 34.1%, respectively (p = .7027). No unexpected adverse events were reported for any group. The mean bilateral change in intraocular pressure (mmHg) was -5.1, -4.4, and -4.2 for bimatoprost, travoprost, and latanoprost, respectively (p = .2811). Patients' willingness to continue with their study treatment was similar for all treatment groups (p = .1669), with 93.7% of travoprost patients, 88.6% of bimatoprost patients, and 87.5% of latanoprost patients indicating that they were very or extremely willing to continue with their treatment.

Conclusions: After 1 year of use, prostaglandin analogs effectively lower intraocular pressure and provide comparable safety and tolerability. Glaucoma medications in the prostaglandin analog class have similar safety profiles after 12 months of use. Patient willingness to continue with treatment was high for all 3 medications.

PERSISTENCY OF PROSTAGLANDIN ANALOG TREATMENT AT LAUNCH AND TWO YEARS LATER
J. Hansen1, J. Walt1, M. Rucker2, A. Joyce2
1 Global Health Outcomes, Allergan, Inc., Irvine, CA, USA, 2 PharMetric - IMS Health, Watertown, MA, USA

Purpose: To determine whether patient persistency with intracocular pressure-lowering prostaglandin analogs at market introduction differs from persistency after 2 years of physician experience.

Methods: Using insurance claims data indicating use of latanoprost, bimatoprost, or travoprost, patients newly starting on prostaglandin analog medication were divided into 2 cohorts based on the first fill date. One cohort began treatment in 2001 (N = 2546), when bimatoprost and travoprost were introduced, and the second in 2003 (N = 4952). Patients were followed for at least 2 years. Kaplan-Meier survival curves were calculated based on the number of therapy days until drug discontinuation, assuming 60 days of therapy per 2.5 mL bottle of medication. Cox Proportional Hazard Models were used to determine the relative risk of therapy discontinuation.

Results: For patients beginning prostaglandin analog therapy in 2001, persistency with latanoprost diverged from that with bimatoprost and travoprost. For patients starting therapy in 2003, bimatoprost and latanoprost persistencies did not statistically differ (p = .320), but risk of discontinuation was higher with travoprost (p < .008).

Conclusion: Prostaglandin analog persistency at the time of introduction differs from persistency after several years of physician experience. Building experience with new medications allows physicians to prudently incorporate them into their practices. Within 2 years of launch, persistency with bimatoprost was at the same level as latanoprost, which had been available longer.

LATANOPROST AND USUAL CARE IN THE TREATMENT OF GLAUCOMA OR OCULAR HYPERTENSION: RESULTS OF A 36-MONTH, RANDOMIZED, OPEN-LABEL STUDY IN SWEDEN AND FINLAND
B. Friström1, H. Uusitalo2, S. Forsman3
1 University Hospital, Linköping, Sweden, 2 University of Tampere, Finland, 3 Pfizer AB

Purpose: This study compared time to treatment failure, intraocular pressure (IOP) changes, and tolerability of latanoprost versus usual care over 36 months in patients needing a change in ocular hypotensive therapy.

Method: This study was conducted at 19 sites in Sweden and 7 in Finland. Adult subjects with ocular hypertension or glaucoma with mean diurnal IOP levels at least 21 mmHg on ocular hypotensive monotherapy were randomized to latanoprost monotherapy or usual care (commercially available therapy except a prostaglandin analog) and followed for 36 months. Endpoints included time to treatment failure (from baseline to the visit at which a change in addition to treatment was made), diurnal IOP (the mean of 8 am, 12 am, 4 pm IOP measurements) at months 6, 12, 24, and 36, and tolerability.

Results: In all, 326 subjects received at least 1 dose of latanoprost (n = 162) or usual care (n = 164); mean (SD) ages of subjects were 66.0 (9.2) and 67.4 (9.5), respectively, and nearly 50% in each group was diagnosed with open-angle glaucoma. The median time to treatment failure was longer for latanoprost (36 months) than for usual care (12 months, p < 0.001 [logrank test]), and the percentages of subjects who had no treatment failure (success rates) at 36-months, were 51% and 24%, respectively (p < 0.001). Compared to baseline, reductions at months 6 and 12 in mean diurnal IOP levels were significantly greater for latanoprost (p < 0.01 [ANCOVA]). The least square mean reduction (SEM) in IOP compared to baseline at month 6 was -4.6 (0.3) mmHg for latanoprost and -3.1 (0.3) mmHg for usual care (95% CI for between-group difference: -2.2,-0.8; p < 0.001; n = 326) and at month 12: latanoprost, -3.9 (0.3) mmHg; usual care, -2.8 (0.3) mmHg (95% CI for between-group difference: -1.8,-0.4; P=0.003; n=326). No serious adverse events were judged to be treatment related.

Conclusion: Patients who fail previous treatment for ocular hypertension or glaucoma and who are switched to latanoprost or usual care have significantly prolonged time to treatment failure after treatment initiation with latanoprost. The IOP-reducing effect and tolerability of latanoprost are sustained over the long-term.

EFFECT OF THE NUMBER OF GLAUCOMA PRESCRIPTION BOTTLES ON PERSISTENCY
E. Higginbotham1, J. Hansen2, J. Walt2, A. Guckian3
1 Ophthalmology Department, University of Maryland-Baltimore, Baltimore, MO, USA, 2 Global Health Outcomes, Allergan, Inc., Irvine, CA, USA, 3 Wolters Kluwer Health, Phoenix, AZ, USA
Purpose: To analyze patterns of persistency when patient prescriptions call for 1 combination therapy versus 2 or 3 separate bottles of glaucoma medications.

Method: Using a retail pharmacy claims database (Wolters Kluwer Health), 3 glaucoma patient cohorts were defined and followed for 12 months (January 2004 through December 2004). Patients in cohort 1 (n = 14742) had a prescription for a single combination therapy during the month of January 2004. Cohort 2 (n = 18411) was made up of patients with prescriptions for a β-blocker and one other glaucoma product in the same month. Cohort 3 (n = 4826) comprised patients with prescriptions filled for 3 different glaucoma therapies during the first month. Persistency was defined as having a refill within 120 days of the initial or preceding fill. For the 2 cohorts with multiple prescriptions, patients were considered nonpersistent when at least one of the qualifying products was not refilled within 4 months. The percentage of patients remaining on therapy over the 12-month period was calculated.

Results: Cohort 1 (single combination therapy) was more persistent than cohort 2 (2 bottles), with 35% versus 27% of patients remaining on therapy at the end of the study period (p < .0001). Cohort 3, with 3 different prescriptions per patient, had the lowest percentage (24%) remaining on therapy (p < .0001). Cohort 2 with 2 bottles was more persistent than cohort 1 (2 combination therapies during the first month). Persistency was defined as having a refill within 120 days of the initial or preceding fill. For the 2 cohorts with multiple prescriptions, patients were considered nonpersistent when at least one of the qualifying products was not refilled within 4 months. The percentage of patients remaining on therapy over the 12-month period was calculated.

Conclusion: As the number of separate products used for glaucoma therapy increases, patient persistency decreases. A management regimen requiring as few products as possible may enhance glaucoma patient persistency.

P297
COST OF STANDARD CARE TREATMENT IN THE UNITED KINGDOM AMONG PATIENTS WITH PROGRESSION OF PRIMARY OPEN ANGLE GLAUCOMA
K. Berenson1, L. Stern1, J. Walt2
1 Analytica International, 2 Allergan Inc., United Kingdom

Objective: Develop a health economic model to measure the standard of care costs in the United Kingdom (UK) associated with progression of primary open angle glaucoma.

Methods: We used Monte Carlo techniques to model the cost of a simulated cohort of 600 patients with Mean Deviation (MD) score progression over four years. MD scores were used to estimate resource utilization for the cohort using regression equations from an analysis of the relationship between resources and MD score in the worst eye from a European chart review of glaucoma patients (N = 194 from UK, Italy, France, Germany and Austria). Both medical (number of office visits, visual field exams, trabeculectomies) and pharmacy resources (number of glaucoma medications) were included in the model. UK NHS reference costs were applied to the medical resource utilization estimates; medication costs from the British National Formulary were applied to the pharmacy utilization estimates. MD scores were also used to predict utility scores based on a regression analysis of utility scores among glaucoma patients in Sweden; the quality-adjusted-life years (QALYs) over four years was modeled. A probabilistic sensitivity analysis was also performed.

Results: The four-year cost for the cohort was £ 932 per patient (£ 196 in pharmacy costs and £ 736 in medical costs) with 2.96 QALYs accumulated over four years.

Conclusion: Glaucoma progression as evidenced by worsening MD scores is associated with a loss in quality of life and substantial costs over four years of follow-up. Managing the disease and delaying progression has the potential to improve quality of life and reduce costs among patients with progression.
The purpose of the present research was to compare responses in two patient populations.

**Methods:** The content/face validity of a 62-item, self-administered questionnaire was confirmed by 9 glaucoma specialists. Questions concerned demographics, health and medications, use of problems with medications, and visual function. The instrument was administered anonymously to 102 consecutive patients in a tertiary metropolitan glaucoma referral practice (Glaucoma Practice) and 100 in a more rural multi-specialty ophthalmology practice (Multispecialty Practice). All participants were prescribed ≥ 1 ocular hypertensive medication and had no history of trabeculectomy.

**Results:** Patients in the Glaucoma Practice were more likely to be younger, African American, and better educated (p < 0.05 for each). In both, > 80% had glaucoma with > 60% diagnosed > 3 years previously; 45% of patients in the Glaucoma Practice and 58% of those in the Multispecialty Practice used a single type of eye drop. Most (Glaucoma, Multispecialty: 86.6%, 92.6%) reported administering drops every day, but more in the Multispecialty Practice reported administering drops at the same time every day (78.6%, 91.6%; p < 0.05). More than 70% of patients in both practices reported that they expected to take ocular hypertensive medication(s) for the rest of their lives. Number of adherence problems (mean = 1/patient) and adherence scores (mean = 24; possible scale range = 0-25) were similar. Common adherence barriers were falling asleep, forgetting when regular schedule changed, and forgetting when traveling. In the Glaucoma Practice, number of adherence problems was correlated with adherence score (r = -0.611, p < 0.0001) and number of side effects (r = 0.349, p < 0.0001).

**Conclusion:** Several adherence barriers appear to cross demographic profiles. Physicians should incorporate adherence counseling broadly and not stratify by demographics.

**P300**

**HEALTH CARE RESOURCE UTILIZATION AFTER RANDOMIZATION TO LATANOPROST OR USUAL CARE IN GLAUCOMA OR OCULAR HYPERTENSION PATIENTS: RESULTS OF A 36-MONTH, RANDOMIZED, OPEN-LABEL STUDY IN SWEDEN AND FINLAND**

H. Uusitalo1, B. Friström2, J. Kowalski3, A. Mörk4

1 University of Tampere, Finland, 2 University Hospital, Linkoping, Sweden, 3 JK Biostatistics, 4 Pfizer AB

**Purpose:** This study compared health care resource utilization over 36 months in groups randomized to treatment initiation with latanoprost or usual care in patients who needed a change in ocular hypertensive therapy.

**Method:** This study was conducted at 19 sites in Sweden and 7 sites in Finland. Adult subjects with ocular hypertension or glaucoma with mean diurnal intraocular pressures (IOPs) 21 mmHg or greater were randomized to latanoprost monotherapy or usual care (commercially available therapy except a prostaglandin analog) and were followed with respect to resource utilization for 36 months regardless of any change in treatment regimen. Resource utilization endpoints included hospitalizations due to glaucoma or other ocular conditions, ocular surgical procedures, medications, and out-patient health care resource use. The analyses used Swedish and Finnish unit costs, the mean cost for non-protocol specified out-patient health care resource use. The analyses used Swedish and Finnish unit costs, the mean cost for non-protocol specified out-patient health care resource use.

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Latanoprost</th>
<th>Usual Care</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ocular surgical procedures</td>
<td>SEK 13,379 (7,735)</td>
<td>SEK 11,163 (7,145)</td>
<td>0.001</td>
</tr>
<tr>
<td>Medications</td>
<td>SEK 7,412 (4,960)</td>
<td>SEK 7,163 (4,845)</td>
<td>0.1</td>
</tr>
<tr>
<td>Out-patient health care resource use</td>
<td>SEK 12,813 (8,945)</td>
<td>SEK 11,163 (8,145)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

**Conclusion:** Systematic variation in total direct costs generated over 36 months in groups randomized to treatment initiation with latanoprost or usual care, although time to treatment failure favored latanoprost.

**P301**

**QUALITY-OF-LIFE IMPACT OF GLAUCOMA VERSUS OTHER CHRONIC DISEASES**

J. Walt1, J. Hansen2, T. Mills2, Sl. Law2

1 Allergan Inc., 2 Wolters Kluwer Health, 3 Jules Stein Eye Institute, USA

**Purpose:** Chronic diseases have a long-term negative impact on quality of life (QoL). Decreased QoL is associated with increased financial burden on healthcare systems and society. Few studies have investigated the impact of glaucoma on patients’ QoL in comparison to other chronic diseases observed in patients with similar demographics. We performed a systematic literature search to assess QoL in glaucoma and 3 chronic diseases: osteoporosis, type 2 diabetes mellitus, and dementia.

**Methods:** Results from studies employing the most frequently used and widely-known generic instruments (Short-Form Health Survey [SF]-36, -12 and -20, EuroQol EQ-5D, and Sickness Impact Profile [SIP]) are reported here.

**Results:** Of 146 total QoL publications identified, SF-36 was used in 77 (glaucoma = 8; osteoporosis = 25; diabetes = 40; dementia = 4), SF-12 in 19 (glaucoma = 1, osteoporosis = 5, diabetes = 9, dementia = 4), SF-20 in 7 (glaucoma = 1, diabetes = 6). EQ-5D in 29 (glaucoma = 2; osteoporosis = 9; diabetes = 9; dementia = 9), and SIP in 6 (glaucoma = 2; osteoporosis = 1; diabetes = 3, dementia = 0). Similar trends were observed across studies using SF-36, -12 or -20: social functioning domains were affected least, and physical domains affected most in glaucoma; in general, QoL was affected to a similar degree in all diseases. By EQ-SD, in glaucoma, utility decreased with increasing glaucomatous damage (0.84 for mild, to 0.72 for severe damage). The highest mean values using the EQ-5D instrument were similar across all four diseases. Mean overall utility scores were 0.80 and 0.89 in the two glaucoma studies, and ranged from 0.06-0.86 (note the 0.06 score was based on a sample of one patient) in osteoporosis, from 0.31-0.86, and from 0.34-0.86, in diabetes and dementia, respectively. Mean SIP scores increased (QoL decreased) with severity of the glaucoma, ranging from 3.4 (mild) to 5.2 (severe). Total SIP scores for glaucoma were similar to those for patients with diabetes (note the 0.06 score was based on a sample of one patient).

**Conclusions:** QoL in glaucoma decreases with increasing disease severity; physical domains are affected more than social domains. Although there are limited published QoL studies in glaucoma, its impact on QoL appears to be broadly consistent with other serious chronic diseases. Further efforts towards diagnosing and treating glaucoma, to reduce financial burden on healthcare systems and society, are warranted. [This abstract has also been submitted to ARVO 2008].
P303

INFLAMMATORY CELLS IN THE CONJUNCTIVA AND THE SUCCESS OF DEEP SCLERECTOMY IN PATIENTS WITH PRIMARY OPEN-ANGLE GLAUCOMA AND EXFOLIATION GLAUCOMA

M. Helin1, S. Rönkkö2, T. Puustjärvi1, M. Terärivi1, M. Ollikainen1, H. Uusitalo1
1 Kuopio University Hospital, 2 Tampere University Hospital, Finland

Purpose: To investigate the inflammatory alterations in the conjunctival stroma of patients with primary open-angle glaucoma (POAG) and exfoliation glaucoma (ExG) who underwent deep sclerectomy (DS) surgery.

Methods: We used samples of POAG and ExG patients, and these were divided into four groups on the basis of whether their excision operation had been successful or not, i.e. POAG S, POAG F, ExG S, ExG F. Control subjects were obtained from other ophthalmologic patients who did not have glaucoma, and conjunctivae were examined to be normal. Seven different antibodies were used to detect inflammatory cell counts in the stroma of the conjunctiva: CD3 (T-lymphocyte marker), CD4 (T-helper lymphocyte marker), CD8 (T-cytotoxic lymphocyte marker), CD20 (pan-B cell marker), CD38 (plasma cell marker), CD45RA (naïve T-cell marker) and CD68 (macrophage marker).

Results: We found out that the number of T-lymphocytes, especially T-cytotoxic lymphocytes, B cells, plasma cells and macrophages was largest in POAG F and ExG F patients. Cell expression was also higher in all patient samples when compared to control subjects. High numbers of cytotoxic and helper T-lymphocytes, plasma cells and macrophages indicate a chronic inflammatory reaction in the conjunctivae of glaucoma patients.

Conclusions: Based on these results we conclude that chronic inflammation may be a significant risk factor for DS surgery failure. Conjunctival changes may be induced by the type and duration of medication or by the used preservative.

P304

THE ROLE OF SUBCONJUNCTIVAL 5-FLUOROUROCICIL IN THE PROTECTION OF FILTERING BLEB

Z. Mandic, M. Zoric Geber, K. Novak Laus, J. Korsic
University Department of Ophthalmology, Clinical Hospital "Sestre Milosrdnice", Zagreb, Croatia

Purpose: Operative trauma during cataract extraction on patients with previous trabeculectomy predisposes to bleb failure and survival of the filtering bleb. This study was carried out to evaluate the protective effect of subconjunctival 5-fluorouracil (5-FU) application to help preserve functioning trabeculectomy blebs.

Methods: The first study group of patients included 22 eyes with preexisting bleb from trabeculectomy, that underwent phacoemulsification. At the end of the operation they received 5-FU injection one week after the first procedure. The second group of patients included 28 eyes with filtering bleb from trabeculectomy, that underwent phacoemulsification without the application of antimetabolites. Comparison of IOP, visual acuity, number of antiglaucoma medications and postoperative complications were analyzed between the two groups.

Results: There was a significant deference in mean change of IOP between the groups at 10 months postoperatively. Worsening of IOP in first group with application of 5-FU was seen in 15.5% and in 28.5% in group without antimetabolites. No serious complications registrated in the study.

Conclusion: Application of 5-FU at the end of cataract operation may reduce fibroblast proliferation and protect trabeculectomy bleb. The study suggests that we can avoid postoperative antiglaucoma medications or even another surgical procedure.
Purpose: To evaluate the effects of mitomycin C (MMC) in deep sclerectomy with collagen implant when applied under the superficial scleral flap or under the deep scleral flap.

Methods: Twenty-five patients with primary or secondary open-angle glaucoma were randomly distributed to the two treatment arms. In the superficial MMC group, MMC was applied under the superficial scleral flap using a soaked sponge for 60 seconds; in the deep MMC group, MMC was applied under the deep scleral flap for 60 seconds before unroofing the Schlemm’s canal. In both groups, remaining MMC was irrigated with 40 mL balanced salt solution. Patients underwent complete ophthalmic examinations at day 1, week 1, months 1, 2, 3, 6, 12, 18, and 24. Appearance and volume of filtering blebs were studied with ultrasonic biomicroscopy at the last follow-up visit.

Results: Preoperative IOP was 20.5 ± 6.3 mmHg (deep MMC) and 21.6 ± 6.7 mmHg (superficial MMC). After surgery IOP was 5.3 ± 3.1 mmHg (deep MMC) and 6.9 ± 4.7 mmHg (superficial MMC) at day 1, 11.4 ± 4.1 mmHg (deep MMC) and 12.7 ± 3.1 mmHg (superficial MMC) at month 1, and 13.0 ± 2.1 mmHg (deep MMC) and 11.8 ± 5.4 mmHg (superficial MMC) at a mean follow-up of 18.5 months (p = ns). There was no significant difference in number of postoperative complications. Mean volume of intrascleral bleb was 1.93 mm3 (deep MMC) and 6.23 mm3 (superficial MMC) (p < 0.05).

Conclusion: No significant difference in success rates was found between the two groups at a mean 18.5 months follow-up. Deep scleral application of MMC, however, seems to produce significantly smaller intrascleral filtering spaces.

P306
A COMPARATIVE STUDY BETWEEN BEVAZICUMAB AND 5 FLUOROURACIL SUBCONJUNCTIVAL INJECTIONS TO MODIFY WOUND HEALING AFTER TRABECULECTOMY IN NEOVASCULAR GLAUCOMA: A CASE REPORT
N. Ruangvaravate, P. Hirunyachote
Department of Ophthalmology, Siriraj Hospital, Faculty of Medicine, Mahidol University, Thailand

Purpose: To compare the result of anti-scarring (by subconjunctival injection) between bevacizumab and 5 fluorouracil (5 FU) after trabeculectomy with mitomycin C (MMC) in neovascular glaucoma.

Methods: This retrospective interventional case study includes two eyes of same patient who has neovascular glaucoma both eyes due to ocular ischemic syndrome from bilateral internal carotid artery occlusion. First, right eye underwent trabeculectomy with MMC (0.2 mg/ml for 2 minutes) after adequate panretinal photocoagulation (PRP). Post operative subconjunctival injections of 5 FU (5 mg) were performed 3 times in the first month and then 4 times in every 3-4 weeks (totally 7 injections in 4 months) based on signs indicating the likelihood of an active scarring process. Two years later, he developed neovascular glaucoma on left eye. He was treated with adequate PRP and then followed by trabeculectomy with MMC (2 mg/ml for 2 minutes). Two days after surgery, subconjunctival injection of bevacizumab (2.5 mg) was performed for single dose. Visual acuity, intraocular pressure, bleb morphology and complications were recorded.

Results: Visual acuity was improved in both eyes. Intraocular pressure was well controlled (<15 mmHg) without medication in both eyes. The follow up period was 2.8 years for right eyes and 3 months for left eye. Bleb morphology was good in both eyes. There was mild corneal epithelial toxicity in right eye which using 5 FU injection. No significant complication was recorded in left eye that using bevacizumab injection.

Conclusions: Subconjunctival injection of bevacizumab after trabeculectomy with MMC had a favorable outcome without serious complications. Bevacizumab may possible be an adjunctive therapy after trabeculectomy in neovascular glaucoma.

Poster Session 32
ADDENNUM
P307
THE PROGNOSTIC VALUE OF THE EARLY WUERZBURG BLEB CLASSIFICATION SCORE FOR THE LONG-TERM OUTCOME OF TRABECULECTOMY
T. Klink, G. Kann, P. Ellinger, F. Grehn
University Eye Hospital Wuerzburg, Wuerzburg, Germany

Purpose: The Wuerzburg bleb classification score (WBCCS) serves to assess filtering blebs in a standardized fashion. Purpose of this retrospective study was to evaluate the prognostic value of the early postoperative WBCCS for the long-term outcome of trabeculectomy.

Methods: The WBCCS provides a scheme to grade clinical bleb morphology. It evaluates the following parameters: vascularity, corkscrew vessels, encapsulation and microcysts assessing each with a score from 0 to 3. The WBCCS of 113 eyes of 113 consecutive patients after trabeculectomy was analysed 1 day; one and two weeks; 3, 6 and 12 months after surgery. Complete success was defined IOP < 21 mmHg and > 20% pressure reduction without glaucoma medication after one year.

Results: The mean max. preoperative IOP was 23.9 ± 7.8 mmHg. The mean postoperative IOP was 12.4 ± 4.4 mmHg and complete success rate of 85.3% (58) was achieved after one year. The total bleb score after one week was 7.5 ± 1.3, after 2 weeks 7.2 ± 1.6 and after 1 year 9.7 ± 1.4 in the success group and 7.5 ± 1.7, 7.2 ± 1.2 and 9.0 ± 0.85 in the failure group respectively. There was only after one year a statistical significant difference concerning the total bleb score between the two groups. Evaluation of the single parameters showed a significant higher score for vascularity after one week (p = 0.02) and for encapsulation after two weeks (p = 0.0087) for the complete success group.

Conclusions: The study could not reveal any prognostic value of the early total bleb score using the WBCCS for the long-term outcome of trabeculectomy. Considering the single parameters in the early phase of bleb development a low score for vascularity and encapsulation seemed to be attached with a long-term failure of trabeculectomy.

P308
TREATMENT OF PATIENTS WITH WOUND LEAKAGE AFTER FILTERING SURGERY
I. Bednar1, K. Novak Lauš2, M. Zorić Geber3, Z. Mandić4
1 Dr. Med., 2 Dr. Sc., Dr. Med., 3 Mr. Sc., Dr. Med., 4 Prof. Dr. Sc., Dr. Med., Croatia

Aim: To demonstrate the possibilities of successful surgical treatment of patients with wound leakage after filtering surgery through 3 different case reports.

Subjects and methods: This case series shows patients who have developed a wound leakage in the late post-surgical period after filtering surgery. Autologous blood serum injection, excision of the inadequate filtering bleb or bleb revision with a scleral patch graft were the treatments of choice in our cases.

Results: Patients treated with those methods showed no sign of neither hypotonia nor secretion during at least six-month post-surgical period. During that period, two of the patients developed complicated cataracts. After cataract surgery the function of the filtering bleb was preserved.
Conclusion: During the several months of patients’ follow-up, mentioned methods have shown to be successful in high-risk patients who have developed late post-surgical complications in the form of wound leakage after filtering surgery.

**P309**

**RANDOMIZED TRIAL COMPARING THREE FIXED COMBINATIONS OF PROSTAGLANDINS/PROSTAMIDE WITH TIMOLOL MALEATO**

J.P. Kelly Rigollet, J.A. Ondategui, M.A. Pasto, L. Lop
Institut Catalá de la Salut, Centre de Atenció Primària MANSO, Eixample Esquerra, Barcelona, Spain

Objectives: to evaluate the advantages and disadvantages of the use of fix combinations of prostaglandins analogs and prostamide with timolol maleato, in tree groups of patients diagnosed with open angle chronic glaucoma or ocular hypertension using before more than one antiglaucoma drug. We put the emphasis in the decreasing of intraocular pressure.

Method: This clinical study, both descriptive and prospective, was carried out on 65 out-patients, 128 eyes were included, diagnosed with open angle chronic glaucoma or ocular hypertension and already treated with more than one antiglaucoma drug. They signed the informed consent to participate in this study. An initial evaluation of all the patients was made after one month without treatment to evaluate the initial IOP. The pachimetry was also included in this study. Patients were assigned at random to one of the three groups. An evaluation was made monthly using the same masked observer in which the IOP was measured and the patient was asked about possible adverse reactions. The length of the study was six months. Differences between initial IOP and pachimetry of the 3 groups were not statistically significant. We also described the characteristics of that population studied.

Results: All this three medicines decrease the IOP to levels without statistical differences. The lowering action of the 3 groups, related to their own initial pressure, expressed in percentage of the initial IOP, show that Xalacom® and Ganfort® achieve higher percentage of lowering pressure. The difference between Ganfort® and Duotrav® is statistically significant for all the 6 months and we didn’t find differences between Xalacom® and Duotrav®. The symptoms related show us that Ganfort® has more related red eye than the other medicines. Even Duotrav® had less red eye than Xalacom® this difference was not statistically significant. Dryness sensa-
tion was related more in Duotrav patients but this difference was not statistically significant. The dark eye rings were related more in patients under Ganfort®.

Conclusions: The three combinations are good depressors of the IOP; they all achieve important reductions in the IOP. We found difference in the related symptoms and the more important was the red eye and the eye dark rings in the Ganfort® group.

**P310**

**COMPARISON BETWEEN ORAL DIAMOX AND IOPIDINE 1% FOR PREVENTION OF INTRAOCULAR PRESSURE RISE FOLLOWING ND:YAG CAPSULOTOMY AND IRIDOTOMY**

T. El-Khashab, M. Neugbauer
Leighton Hospital, United Kingdom

Introduction: Apraclonidine (para-aminoclonidine) 1% is an alpha agonist that was studied for its effect on the IOP rise following Yag laser capsulotomy and Iridotomy. In a prospective double-masked study 179 eyes were pretreated with one drop of either 1% apraclonidine or oral Diamox SR 250mg 1 hour prior to performing YAG and again after the laser treatment. Iopidine was instilled immediately following laser procedure and Diamox was given to patients to take 8 hours following laser. The greatest IOP rise in the diamox-treated eyes occurred in the forth hour after laser when the mean IOP fell from a baseline pressure of 16.4 ± 4 mmHg to 13.8 ± 4.8 mmHg (p less than .01). In apraclonidine-treated eyes the IOP fell from a mean of 16.6 ± 3.6 mmHg to 12.8 ± 6.0 mmHg 4 hours postoperatively (p less than .01). There were as many eyes that had a pressure rise more than 10 mmHg in the Diamox-treated group compared to those treated with apraclonidine. Apraclonidine and oral diamo proved to be highly effective in preventing the rise in IOP following Yag laser capsulotomy and iridotomy.

Conclusion: Oral diamox is as effective as iopidine eye drops 0.5%, much cheaper and is readily available alternative to iopidine.

**P311**

**CENTRAL CORNEAL THICKNESS AS A RISK FACTOR OF PRIMARY OPEN-ANGLE GLAUCOMA PROGRESSION**

A. Kuroyedov, V. Gorodnichy, E. Tsalkina
Mandryka 2nd Clinical Military Hospital, Russia

Correlation between central corneal thickness, IOP level and some morphofunctional parameters has been observed in patients with POAG, receiving different types of treatment. Results of evaluation of two groups of patients are listed in this paper: those, who received medical treatment (71/116) and those, who underwent antiglaucomatous surgery (60/73). Most of operated patients had thinner corneas as compared to those, who received medical treatment. Typical tendency in changes of morphofunctional parameters was observed depending on the stage of the disease. Statistically significant difference was found in cup profile parameters as well as in values, that characterize CCT, neuroretinal rim and IOP level in patients with early and moderate stages of glaucoma. Results of correlation analysis in patients with advanced glaucoma, who received medical treatment, in most cases show significant correlation up to ± 0.99. Thus, CCT negatively correlates with RNFL (-0.99); neuroretinal rim parameters (-0.59 and -0.88); IOP level (-0.6 and -0.72). At the same time moderate and strong positive correlation was observed between CCT and cup parameters (0.66 and 0.73) and functional indices (0.89 and 0.88). In patients with early and moderate stages of disease no such results were found. Summarizing these data we speculate that from one stage to the other CCT value is essential for:

I st. – IOP level, ONH (rim area and volume, cup profile, C/D ratio, disc area), RNFL, perimetry;
II st. – IOP level, perimeter, ONH (rim area, disc area, cup profile, rim volume, C/D ratio), RNFL;
III st. – RNFL, ONH (rim area), perimeter, ONH (disc area), IOP level, ONH (C/D ratio, rim volume). Taking into consideration limited number of patients with large ONH we find it necessary to continue this study to evaluate CCT influence in this group of patients with glaucoma.

**P312**

**THE GLAUCOMA SUSPECTS THE DILEMMA. WHAT IS NEW?**

S. Saif1, M.Y.S. Saif2, A.T.S. Saif3
1 National Institute of Laser Enhanced Sciences, Cairo University, 2 Beni Sueif University, 3 Fayoum University, Egypt

Principle: The risk factors for getting glaucoma will channel into the resultant level of IOP and disc damage. The proba-

www.eugs.org
bility was calculated by the equation $Y_1 = Y_0 + A \cdot \frac{X}{T_1}$ using the IOP and cup disc ratio. Accordingly people are classified into: Normal, Ocular hypertension, Possible, Probable, Highly probable and Definite glaucoma. In this way the clinical entities of normal, ocular hypertension, and glaucoma suspect, low tension glaucoma and definite glaucoma cases are precisely digitized and diagnosed. The target IOP is calculated according to the cup disc ratio. The details of combined probability of IOP, C/D ratio and the target IOP will be presented in details.

Material and method: In the last 5 years 101458 Egyptians were screened in the charity campaigns (organized by Cairo University). In this study 1546 eyes (probability ranged from 0.1 - 0.2) divided into 3 groups: 841 eyes of ocular hypertension, 621 eyes suspicious cupping (c/d 0.5 or more) and 84 eyes with nerve fibre defect.

Results: With the use of the glaucoma probability table dividing them into normal (probability till 0.1) possible (probability till 0.2) probable (probability more than 0.2 were treated aiming at a target IOP as described in the table).

Note the IOP was corrected for the corneal thickness and the C/D ratio was corrected for the disc damage and the remaining viable rim.

Conclusion: Follow up for 2 years denotes the validity of the table that we can consider that the glaucoma suspect is no more a dilemma.

This paper is in principle basic science and epidemiology.