Purpose:

Randomized Study Treatment Assessed By Spectral Domain Oct, Fundus Autofluorescence, Morphologic Changes In Pigment Epithelial Detachment After Ranibizumab

Clinical Trial:

None; None; None

Support:

EY014801, Research to Prevent Blindness

Clinical Trial: http://www.clinicaltrials.gov, NCT00976222

Program Number: 1659 Poster Board Number: A54
Presentation Time: 1:45 PM - 3:30 PM

Topography of Geographic Atrophy in Age-Related Macular Degeneration

Mariana M. Maucci1, Steffen Schmitz-Valckenberg2, Arno P. Göbel1, Monika Fleckenstein1, Glenn J. Jaffe1, Frank G. Holz1

Ophthalmology, University of Bonn, Bonn, Germany; Ophthalmology, Hospital Sao Joao, Vila Nova de Gaia, Portugal; Ophthalmology, Duke University Eye Center, Durham, NC.

Purpose:

To determine the topographic distribution of geographic atrophy (GA) patches in patients with advanced dry age-related macular degeneration (AMD)

Methods:

Confocal scanning laser ophthalmoscopy fundus autofluorescence images (FAF, exc = 488, em 500 - 700 nm) from 348 right eyes of 348 patients from the Geographic Atrophy Progression (GAP) Study were retrospectively analyzed using a modified Early Treatment Diabetic Retinopathy Study (ETDRS) grid to divide the posterior pole into 10 different sectors, the localization of atrophic patches for each sector was established at baseline. Quantification of GA areas was performed by semi-automated image analysis software.

Results:

The mean total size of GA area was 7.29 mm2 (range 1.25 to 17.8); Clear foveal sparing was present in 119 eyes (34%), while subfoveal lesions were seen in 70 eyes (20%). In 159 eyes (46%), the involvement of the fovea was not gradable with certainty. Sector analysis showed atrophy involvement within 500 microns from the foveal center to be present in 96% of all eyes. The parafoveal macula (circle of 3000 microns centered on the fovea) showed GA more frequently (98%) when compared to more eccentric areas (circle of 6000 microns; 63%). In 32 (9%) eyes, atrophy was found beyond 6000 microns from the foveal center. Both in the sectors from the middle circle and the outer circle, atrophy was recorded more frequently in the temporal (97% and 64%) as opposed to the nasal macula (91% and 60%). Superior involvement from the foveal center (95% and 63%) was similar compared to inferior involvement (98% and 62%).

Conclusions:

The prevalence of an eccentricity-dependent development and an asymmetrical topographic distribution of GA in relation to the foveal center. The RPE and outer neurosensory retina temporal to the center appears more susceptible than the nasal area for occurrence and expansion of GA. Refined analyses of topographic distribution and directional spread of GA is important both for the understanding of the natural history of the disease as well as for the design and outcome measures for interventional clinical trials.

Commercial Relationships: Matthias M. Maucci, Heidelberg Engineering (F); Sofia Fonseca, Heidelberg Engineering (F); Steffen Schmitz-Valckenberg, Heidelberg Engineering (F, R), Optos Ltd. (F), Topcon UK (F); Arno P. Göbel, Heidelberg Engineering (F); Monika Fleckenstein, Heidelberg Engineering (F, R), Optos Ltd. (F); Glenn J. Jaffe, Heidelberg Engineering (C); Frank G. Holz, Carl Zeiss Meditec AG (C), Heidelberg Engineering (F, C, R), Optos Ltd. (F)

Support: Alcon Research Ltd., Fort Worth, Texas

Clinical Trial: http://www.clinicaltrials.gov, NCT0059846

Program Number: 1660 Poster Board Number: A55
Presentation Time: 1:45 PM - 3:30 PM

Intravitreal Ranibizumab and Intravitreal Triamcinolone with PDT for the Treatment of Retinal Angiomatous Proliferation. A retrospective Comparative Study

Evripidis Sykakis, Michail Malandrakis, Sreekumar Pushpaputh, Andrew Browning, Rajen Gupta, James Talks, Department of Ophthalmology, Royal Victoria Infirmary, Newcastle Upon Tyne, United Kingdom.

Purpose: Retinal angiomatous proliferation (RAP) is a distinct form of neovascular age-related macular degeneration (ARMD), characterised by rapid deterioration of vision and poor prognosis. Many different approaches regarding the management
of RAP lesions have been employed over the last few years. The aim of this study was to compare the 1 year functional outcome of intravitreal Ranibizumab and IVTA plus PDT in the treatment of RAP.

Methods: Retrospective review of patients diagnosed with RAP and who underwent IVTA treatment with or without IVTA (rivazumab or Ranibizumab (0.5mg)). Case notes were evaluated recording: LogMAR best corrected visual acuity (BCVA) pre treatment, 6 and 12 months post treatment, total number of injections, PDT and complications.

Results: A total of 91 eyes of 79 patients diagnosed with RAP were treated. All patients had completed at least 1 year follow up. Out of the 91 eyes, 25 were treated with PDT plus IVTA (group 1) and 66 were treated with Ranibizumab (group 2). In group 1, on an average 1.84±1.21 (mean ±SD) PDT sessions were performed and 1.45±0.88 IVTA injections were given, while in group 2, 6.39±2.89 Ranibizumab injection were given. Mean BCVA at initial examination in group 1 was 56.68±14.28 letters while at 6 months it was 54.95±16.07 and at 12 months it was 56.40±14.93. In group 2 the respective mean BCVA's were 52.45±12.35, 60.68±13.75 and 59.24±14.49. In group 1 patients lost an average of 1.73 letters at 6 months (p<0.05) and 0.28 letters at 12 months (p>0.05) compared to group 2 were patients gained 8.23 letters at 6 (p<0.001) and 6.79 at 12 months (p=0.001).

Conclusions: Both treatment modalities in our cohort stabilised visual acuity in this normally progressive subtype of neovascular ARM only in the absence of RAP. The Ranibizumab group was statistically significant mild improvement in logMAR visual acuity. Additionally, in the group treated with IVTA and PDT significantly less treatment sessions were needed.

Commercial Relationships: Evripidis Sykakis, None; Michail Malandrakis, None; Srerkan Puthoth, None; Andrew Browning, None; Rajen Gupta, None; James Talk, None
Support: None

Program Number: 1661 Poster Board Number: A56
Presentation Time: 1:45 PM - 3:30 PM
Intravitreal Injection Of Antivascular Endothelial Growth Factor Combined With Injection Of Expansile Gas For Treatment Of Exudative Age-related Macular Degeneration With Posterior Vitreomacular Adhesion
Yong Min Kim1, Sung Jun Lee2, Eun Jee Chung1, Hyoung Jun Koh1
1Department of Ophthalmology, Yonsei University College of Medicine, Seoul, Republic of Korea; 2Department of Ophthalmology, Dongguk University School of Medicine, Gyeonggi-do, Republic of Korea.

Purpose: To evaluate the efficacy of intravitreal injection of anti-VEGF combined with injection of expansile gas for the treatment of exudative age-related macular degeneration (AMD) with vitreomacular adhesion (VMA).

Methods: This is a prospective, interventional, pilot case series. Four patients who had no response to the repeated anti-VEGF injections and had a definite VMA diagnosed with spectral domain optical coherence tomography (SD-OCT) were enrolled. Those patients underwent intravitreal perfluoropropane (C3F8) injection, followed by anti-VEGF injection simultaneously. Complete ophthalmological examinations, including corrected visual acuity, slit-lamp biomicroscopic examination, funduscopy examination and SD-OCT were performed.

Results: Induction of posterior vitreous detachment (PVD) at the macula was achieved in all 4 patients within a month. Three patients had received mean 6.3±3.5 intravitreal anti-VEGF injections, but no response of treatment was observed with active lesion based on SD-OCT examination. After injection of expansile gas with anti-VEGF, the macula was detached from any retinal or subretinal fluid within three months. The elevation of intracocular pressure was not noted after this procedure. The frequency of additional injection was 1.6±1.0 during that period. The mean follow-up period after gas injection was 5.2±2.9 months.

Conclusions: An intravitreal injection of the inert C3F8 gas seems to be useful in that it induces without change in the clearance of anti-VEGF. Further investigation involving a larger population with an appropriate control group is necessary to ascertain the efficacy of this combined treatment.

Commercial Relationships: Yong Min Kim, None; Sung Jun Lee, None; Eun Jee Chung, None; Hyoung Jun Koh, None
Support: None
Clinical Trial: http://seiServe.com/ct/c, 4-2009-0611

Program Number: 1662 Poster Board Number: A57
Presentation Time: 1:45 PM - 3:30 PM
Subjective Perception And Objective Parameters Of Visual Function After Intravitreal Ranibizumab Treatment

Purpose: To investigate the relation between subjective perception of visual function and changes of objective parameters after intravitreal ranibizumab treatment in patients suffering from exudative AMD.

Methods: In a prospective interventional case series, 74 eyes of 74 patients with exudative AMD received an initial treatment series of 3 intravitreal ranibizumab injections (IVI) within 3 months follow-up. Standardized monthly patient interviews assessed patients’ subjective perception and vision quality of the study eye either improved, worsened or remained stable over the course.

Objective parameters measured at baseline and 3 months included BCVA (using ETDRS), reading acuity (RA, using LogRAD), and OCT central thickness (height from choroid), and changes were tested for statistical significance with Pearson’s chi-square and Mann-Whitney U tests where applicable.

Results: 50 out of 74 patients (68%) perceived a subjective improvement. 16 patients (21%) no subjective change, and 8 patients (11%) a subjective worsening of visual function. According changes of objective parameters (3 months minus baseline) for these three groups are shown in the table below. These findings were independent of whether the better or worse eye (based on BCVA at baseline) was treated (p>0.9).

Conclusions: In our study 2/3 of patients subjectively benefited from the intravitreal ranibizumab treatment. Subjective perception was significantly correlated with objective changes. Our data indicate that the mean threshold for subjective improvement perception after IVI for AMD is an increase by two to six ETDRS ETDRS.

Our data demonstrate that patients have the same sensitivity for improvement or deterioration when their worse eye is treated.

Support: Supported by the Koeln Fortune Program / Faculty of Medicine, University of Cologne

Copyright 2011 by the Association for Research in Vision and Ophthalmology, Inc., all rights reserved. For permission to reproduce any abstract, contact the ARVO Office at pubs@arvo.org.
Purpose: To compare two treatment-modalities with intravitreal ranibizumab for exudative age-related macular degeneration (AMD) in a clinical setting.

Methods: Retrospective analysis of 83 eyes of 74 consecutive patients treated with intravitreal ranibizumab in a university hospital department. All patients received a baseline treatment of three monthly injections. The retreatment protocol included as-needed rejections in the PRN group (n=32) and rejections according to the Inject and Extend method in the IE group (n=51). The following parameters were recorded for each patient: age, gender, treated eye, type of choroidal neovascularization, Early Treatment Diabetic Retinopathy Study initial and final visual acuity (at 5.2 to 6 weeks), number of injections, and number of follow-up visits.

Results: Groups were not significantly different at baseline for age (p=0.33), gender (p=0.42), initial visual acuity (p=0.99) and type of choroidal neovascularization (p=0.81). At 1 year, there was a significant improvement of visual acuity in the IE group (+6.1 ± 17.8 letters, p=0.01) but not in the PRN group (+4.9 ± 27.3 letters, p=0.98). Eyes in the IE group were given significantly more injections (6.8 ± 0.2 vs 4.6 ± 0.2, p < 0.01). We did not find any significant difference for the visual acuity improvement between our groups (p=0.2). The number of follow-up visits was similar (p=0.96).

Conclusions: In our study the Inject and Extend protocol was more effective than the PRN method for patients with three monthly injections. No new severe complications were reported.

Commercial Relationships: Brice Dugas, Jr., None; Denis Dossars, None; Yann Kauffmann, None; Alain Bron, None; Catherine Creuzot-Garcher, None
Support: None

Program Number: 1665 Poster Board Number: A60 Presentation Time: 1:45 PM - 3:30 PM Bevacizumab and Ranibizumab for Neovascular Age-Related Macular Degeneration: a Treatment Approach Based on Individual Patient Needs Claudiine Bellerive1, Benoît Cinq-Mars2, Gilles Lalonde, Mario Malenfant, Éric Tourville1, Yvon Taratif, Marcelle Giajsson, Marc Hébert2. 1Laval University, Québec, QC, Canada; 2Hôpital du Saint-Sacrement, Québec, QC, Canada.

Purpose: Multicenter clinical trials have shown that monthly intravitreal injections of ranibizumab during the first year is an effective treatment for CNV in AMD. At present, the optimal frequency for VEGF inhibitor injections has not been established. In attempt to reduce the number of treatment required, there is a trend among retina specialists to use a treatment regimen based on patient needs. Patients receive an initial treatment of three monthly intravitreal injections of ranibizumab or bevacizumab and retreatment is individually considered for each patient on the basis of OCT, angiography and clinical examination. The aim of the study was to compare the VA outcomes of ranibizumab and bevacizumab with this therapeutic regimen at 1 year.

Methods: 654 files of patients with either predominantly, minimally classic or occult CNV were reviewed. Data were collected at the Centre Oculaire de Québec between June 2006 and December 2009. All eyes with prior treatment or additional treatment for AMD were excluded. Clinical data included VA at baseline and 12 months (Snellen chart), and number of injections received over 12 months. For analysis, Snellen VA was converted into logMAR.

Results: A total of 192 eyes were included; 50 eyes treated with ranibizumab and 142 eyes with bevacizumab. Mean age at baseline was 76.9 ± 8 years and 76.4 ± 8 years in the ranibizumab and bevacizumab group respectively. Mean logMAR equivalent of VA improved from 0.69 ± 0.55 to 0.55 ± 0.47 at 12 months in the ranibizumab group and 0.70 to 0.67 logMar in the bevacizumab group. At 1 year, 92% of eyes treated with ranibizumab had lost fewer than 0.3 logMAR, as compared with 83% in the bevacizumab group. These observations are similar to those observed in the MARINA (94.6%), ANCHOR (96.4%) and PIER (90.2%) studies. The ranibizumab group received a mean of 4.92 injections over 12 months, compared to 4.75 injections in the bevacizumab group. After the first three injections, 20% of patients in the ranibizumab group and 26% in the bevacizumab group never needed another injection.

Conclusions: VA outcomes of eyes treated with ranibizumab and bevacizumab come close with the results from multicenter clinical trials but with fewer injections. These findings suggest that an approach based on clinical onset and CNV progression at angiography may provide benefit by reducing the risks of adverse events associated with intravitreal injections.

Commercial Relationships: Claudiine Bellerive, None; Benoît Cinq-Mars, None; Gilles Lalonde, None; Mario Malenfant, None; Éric Tourville, None; Yvon Taratif, None; Marcelle Giajsson, None; Marc Hébert, None
Support: Fonds de la recherche en santé du Québec et Réseau Vision


Purpose: To evaluate the incidence of prespecified Antiplatelet Trialists’ Collaboration (APTIC) adverse events (AEs) in controlled AMD studies in subjects with DM treated with pegaptanib sodium 0.3 mg or sham injections.

Methods: Using data from 9 controlled AMD clinical trials, APTC AEs identified by APTIC were compared by study. Events that occurred at least 5% more frequently than for the placebo and between pegaptanib vs sham injection treated subjects with DM. All subjects with a history of DM who received treatment with 0.3 mg pegaptanib (by way of randomization, crossover design, protocol amendment, or change in dose assignment) or sham were included.

Results: In all, 191 subjects with DM had been enrolled (165, pegaptanib; 26, sham); median age: 76.0 years. At least 1 APTC AE was reported for 13/191 subjects; the incidence was lower in the pegaptanib group occurring in 16/165 (6.1%); 13 events) pegaptanib- and 3/26 (11.5%; 3 events) sham-treated subjects. AEs were serious in 10/165 (6.1%, 12 events) and 2/26 (7.7%, 2 events), respectively. At least 1 severe APTC AE occurred in 6/165 (3.6%; 6 events) pegaptanib-treated subjects and 0/26 (0 events) sham-treated subjects. AEs that were significantly more common in the pegaptanib group were: hypertension (15.1% vs 0.0% sham), cerebrovascular accident (CV) and myocardial infarction (MI) were reported for 3/165 (1.8%) and 2/26 (1.2%) pegaptanib-treated subjects and 0/26 (0 events) sham-treated subjects. No APTC AE was considered related to study treatment with the exception of 1 CV, which was considered possibly related in a patient with history of DM, hypertension, and MI.

Conclusions: The low number of subjects with DM makes it difficult to draw conclusions and to interpret between-group differences in individual AE. However, these findings, together with those reported previously in pegaptanib trials, suggest that there is no increased risk of APTC AEs for the diabetic population as a result of treatment with pegaptanib sodium 0.3 mg.

Commercial Relationships: Theresa M. Dombl, Pfizer (E); Kenneth K. Kwoc, Pfizer (E); Robert L. Wiseman, Pfizer (E); Marla B. Sultan, Pfizer (E)
Support: Research supported by Pfizer Inc.

Program Number: 1667 Poster Board Number: A62 Presentation Time: 1:45 PM - 3:30 PM Potential Role Of Flicker Perimetry In Predicting Geographic Atrophy In Age-related Macular Degeneration Chu D. Lual,1 Peter N. Dimitrov,2 Luba Robnum3, Galina Makeyeva,1 Mary Varsamidis1, Khin-Zaw Aung4, Algis J. Vingrys3, Robyn H. Guymec5. 1Macular Research Unit, Centre for Eye Research Australia, East Melbourne, Australia; 2Optometry & Vision Sciences, University of Melbourne, Carlton, Australia.

Purpose: A biomarker of early age-related macular degeneration (AMD) which could be used to follow change over time, predict progression to geographic atrophy (GA) and determine treatment efficacy is urgently required. Using flicker perimetry, our aim was to determine the pattern of flicker sensitivity changes prior to clinically detectable GA.

Methods: In this prospective study, we recruited 182 subjects with early AMD and 24 age-matched normal controls, and followed them at 6 monthly intervals. At each visit, all subjects underwent a clinical eye examination, retinal imaging and flicker visual field testing. The changes in flicker sensitivity of 24 tested locations within the central 6 degrees over 3 visits prior to the development of atrophy were examined.

Results: Of the 182 participants, GA developed in 16 eyes of 16 subjects during the study period. The mean follow up duration was 4.0 years and ranged from 1.5 to 5.0 years. Having taken the rate of change of each test location, the average rate of change in flicker sensitivity over the last 3 consecutive visits in eyes without AMD was -0.003 dB/month (95% CE: -0.021 - 0.015). In eyes that went on to develop GA, there was a greater linear reduction in flicker sensitivity over time of 0.384 dB/month (p=0.017) in the areas that went on to develop GA. A wide spread reduction in flicker sensitivity was also observed in non-atrophic areas but the rate of change in sensitivity was less (-0.07±0.37 dB/month, p=0.008).

Conclusions: The flicker sensitivity within the central 6 degrees was significantly reduced not only at the time GA was detected but also prior to clinically detectable GA. Retinal locations with a greater rate of change in flicker sensitivity appear to correlate with areas that went on to develop atrophy. These findings suggest that flicker perimetry parameters could have a potential role in predicting GA development, monitoring disease progression and determining the efficacy of treatments aimed at slowing progression of disease.

Commercial Relationships: Chi D. Lual, None; Peter N. Dimitrov, None; Luba Robman, None; Galina Makeyeva, None; Mary Varsamidis, None; Khin-Zaw Aung, None; Algis J. Vingrys, None; Robyn H. Goumyer, None
Support: NHMRC Project Grant 350224 RH/GAV; ARC Linkage Project (ARC-LP0211474), NHMRC CCRE, NHMRC practitioner fellowship (RHF).

Program Number: 1668 Poster Board Number: A63 Presentation Time: 1:45 PM - 3:30 PM Five Year Visual Acuity Results in Patients With Wet Age Related Macular Degeneration Treated With Bevacizumab and Ranibizumab Mathew W. Aschbrenner, Daniel P. Joseph. Ophthalmology, Barnes Retina Institute, Saint Louis, MO.
Purpose: To determine visual acuity (VA) and central macular thickness (CMT) in patients with wet age-related macular degeneration (ARMD) receiving bevacizumab and/or ranibizumab with five year (60 month) follow up.

Methods: Retrospective chart review of eligible patients with wet ARMD treated with either bevacizumab or ranibizumab on or before 12/1/2005 with follow up of five years or sixty months at a single institution. Snellen VA was recorded for each visit and converted to logMAR. VA at first injection, 6, 12, 18, 24, 30, 36, 42, 48, 54 and 60 month follow up visits were compared. CMT was recorded using optical coherence tomography (OCT) (Stratus®1) (Carl Zeiss Meditec, Dublin, CA) at first injection, 12, 24, 36, 48 and 60 month follow up. Values were compared using paired t-test.

Results: Eleven eyes had a mean logMAR VA 0.65 (sd +/- 0.27) at initial injection. Mean logMAR VA at six, 12, 18, 24, 30, 36, 42, 48, 54, 60 months was 0.49 (sd +/- 0.12), 0.53 (sd +/- 0.15), 0.66 (sd +/- 0.35), 0.53 (sd +/- 0.37), 0.63 (sd +/- 0.43), 0.58 (sd +/- 0.45), 0.58 (sd +/- 0.29), 0.57 (sd +/- 0.45), 0.56 (sd +/- 0.42), 0.64 (sd +/- 0.45) respectively. There was no statistically significant change in VA at 60 months compared with VA at initial injection (p=.429). At 60 months, 45.5%, 81.8% and 100% of patients had maintained Snellen VA of 20/40, 20/100 and 20/400. Mean CMT was 328 µm (sd +/- 17) at the initial injection visit. Mean CMT was 212 µm (sd +/- 28) 215 µm (sd +/- 34) 195 µm (sd +/- 26) 197 µm (sd +/- 29) 192 µm (sd +/- 20) at follow up visits 12, 24, 36, 48 and 60 months. The difference in CMT between initial visit and 60 month follow up was statistically significant (p<.001). Mean follow up was 7.7 weeks (sd +/- 2.2). Patients received intravitreal bevacizumab or ranibizumab at a mean of 47.7% of visits.

Conclusions: To date, there are no known studies analyzing VA of patients treated with anti-VEGF agents with 60 month follow up. In this study, VA was maintained at 60 months by giving treatment on an as-needed basis as determined by the provider. This study also showed CMT was significantly decreased at 60 months. Thus, anti-VEGF treatment on an as-needed basis can achieve improvement in macular anatomy and maintain VA over five years.

Commercial Relationships: Mathew W. Aschbrenner, None; Daniel P. Joseph, None

Support: None

Program Number: 1669  Poster Board Number: A64
Presentation Time: 1:45 PM - 3:30 PM
Recurrence Of Choroid In Age After 4.6 And 8 Weekly Anti-VEGF Regimen In All Macular Degeneration

Sankha Amarakoon, G.S. Baarsma, L.I. van den Born, J.P. Martinez-Ciriano, T. Missotten, AROL, Medical retina, Rotterdam Eye Hospital, The Netherlands.

Purpose: The purpose of this research is to determine recurrence time of choroidal neovascularization (CNV) in Age-Related Macular Degeneration (ARMD) after patients have been treated with Bevacizumab for 1 year with a fixed treatment schedule.

Methods: 180 patients with ARMD were treated with Bevacizumab for 1 year. At inclusion all patient were randomized into 3 treatment groups. Group 1 was treated with anti-VEGF agents with 60 month follow up. In this study, VA was maintained at 60 months by giving treatment on an as-needed basis as determined by the provider. This study also showed CMT was significantly decreased at 60 months. Thus, anti-VEGF treatment on an as-needed basis can achieve improvement in macular anatomy and maintain VA over five years.

Commercial Relationships: Mathew W. Aschbrenner, None; Daniel P. Joseph, None

Support: None

Program Number: 1670  Poster Board Number: A65
Presentation Time: 1:45 PM - 3:30 PM
Retinal Functional Improvement With Nano-laser Treatment In High Risk Early Age-related Macular Degeneration

Robyn H. Gauymer, Kate Brassington, Peter N. Dimitrov, Mary Varsamidis, Galina Makeyeva, Khin Zaw Aung, Devinder Chauhan, Algis Vingrys, Chi Lau.

Purpose: The aim of this pilot study was to show if a novel nanosecond laser (2RT) treatment could improve visual function and reduce drusen in high risk Early Age-related Macular Degeneration (AMD), which may then lead to reduced risk of late stage AMD.

Methods: Interim results out 0-12 months from a prospective pilot study (ACTRN12609001056280). Early AMD patients selected with high risk Early AMD but without choroidal neovascularization (CNV) or geographic atrophy (GA). Patients examined with visual field perimeter, optical coherence tomography (OCT), auto-fluorescence (AF) imaging, fundus photography, visual acuity). Laser treatment consisted of 12 single laser pulses of 3ns duration, placed in “clock face” pattern around the mid-macular (5deg radius) of one eye using an energy range of 0.15 to 1.5mJ , spot diameter of 400µm, wavelength of 532nm. The patients’ eye with highest risk was treated and main follow-up was performed at 3, 6 and 12mths. Visual field results were used to determine the bilateral regions of greatest dysfunction.

Results: Of the 14 patients that have reached 12mth follow-up showed some level of visual function improvement 5-9 days later by follow up. The regions of greatest dysfunction in visual function improved significantly in 7 of these patients and the majority of improvement occurred in patients with the greatest pre-treatment dysfunction. VA significantly improved (>5 letters) in 5 patients and some level of drusen reduction occurred in 13 of the patients in one or both eyes. No association was evident between the location of visual function improvements and the location of the laser treatment or the eye treated. Decreased function or other adverse events did not occur in the region of the laser spots.

Conclusions: Interim results from this pilot study show that the application of 12 extremely low energy, non thermal, 2RT laser pulses to the mid-macula resulted in visual function improvement in the regions of greatest pre-treatment dysfunction. These regions are likely to be at greatest risk of developing late stage AMD, providing circumstantial evidence that the progress of AMD is being slowed or partially reversed by this laser treatment.

Commercial Relationships: Robyn H. Guymer, None; Kate Brassington, None; Peter N. Dimitrov, None; Mary Varsamidis, None; Galina Makeyeva, None; Khin Zaw Aung, None; Devinder Chauhan, None; Algis Vingrys, None; Chi Lau, None

Support: This work was supported in part by the Victorian Government Department of Innovation, Industry and Regional Development, the Australian Government Department of Industry and Resources and Exelix R&D Pty Ltd Clinical Trial: http://www.anzctr.org.au, (ACTRN12609001056280)

Program Number: 1671  Poster Board Number: A66
Presentation Time: 1:45 PM - 3:30 PM
Rescue Therapy With Combined Anti-VEGF And Pdt For Refractory AMD

Kevin R. Tozer, Lawrence Chong, Sirrvinas R. Sudda.

Purpose: Examine the efficacy of combination anti-VEGF and photodynamic therapy for the treatment of neovascular AMD refractory to anti-VEGF monotherapy.

Methods: Retrospective interventional study. Study patients consisted of a subset of all patients treated at the VMR Institute and the Doheny Eye Institute with anti-VEGF monotherapy for neovascular AMD and considered treatment failures between January 1, 2009 and December 30, 2010. Treatment failure was defined as persistent subretinal or intraretinal fluid after at least 3 anti-VEGF injections in the 7 months prior to combination treatment. Combination treatment consisted of anti-VEGF intravitreal injection followed 28 days later by half-dose PDT.

Commercial Relationships: Sirrvinas R. Sudda, None

Support: None

Clinical Trial: http://www.trialregister.nl/trialreg/index.asp, NTR1174

Program Number: 1670  Poster Board Number: A65
Presentation Time: 1:45 PM - 3:30 PM
Retinal Functional Improvement With Nano-laser Treatment In High Risk Early Age-related Macular Degeneration

Robyn H. Gauymer, Kate Brassington, Peter N. Dimitrov, Mary Varsamidis, Galina Makeyeva, Khin Zaw Aung, Devinder Chauhan, Algis Vingrys, Chi Lau.
Purpose: To study the effects of drusen accumulation on cone photoreceptors in a patient with dry age-related macular degeneration (AMD).

Methods: Adaptive optics scanning laser ophthalmoscopy (AOSLO) and spectral domain optical coherence tomography (SD-OCT) were used to image macular cones in a subject with AMD at two time points (at baseline and 2 years later) and compared with normal values. Digital color fundus photography and infrared and autofluorescent fundus photos were obtained. Visual acuity (VA) and color vision were also measured. Coding sequences of the complement factor H (CFH) gene were bidirectionally sequenced in the subject with AMD.

Results: Molecular analysis revealed homozygous risk factor polymorphisms in the CFH gene (CC at rs2274641 and rs1061170) in a 64-year-old man with dry AMD. Numerous drusen were present in the macula. VA was 20/16, and color vision was normal. SD-OCT showed macular drusen as elevations beneath the RPE-out layer segment junction with protrusion into the photoreceptor outer segment and outer nuclear layer. In the subject with AMD, AOSLO showed contiguous patches of cones interspersed with areas where cone structure was poorly resolved. Localized increases in cone spacing were seen in areas overlying drusen and between drusen, when compared with 9 age-similar normal subjects aged 50-79. In areas directly overlying drusen, there was a decrease in the number of regions with normal cone spacing over 2 years.

Conclusions: AOSLO revealed increased cone spacing in macular areas directly overlying drusen, suggesting the cytotoxic effects of lipofuscin deposits are associated with localized cone loss.

Commercial Relationships: K. A. Woo, None; K. Ratnam, None; D. Merino, None; G. Hughes, None; K. Zhang, None; A. Roorda, University of Houston (P); University of Rochester (P); J. L. Duncan, None

Support: NIH Grants EY002162, EYO14375, Research to Prevent Blindness, Foundation Fighting Blindness, That Man May See, Inc., Hope for Vision, RPB, Burroughs Wellcome Fund, RO1EY14428, RO1EY14448, RO1EY18660

Program Number: 1673 Poster Board Number: A68
Presentation Time: 1:45 PM - 3:30 PM

Fluorescein Angiography and Spectral-Domain Optical Coherence Tomography Features in Classic Choroidal Neovascularization due to Age-Related Macular Degeneration


Purpose: To evaluate the combined Fluorescein Angiography (FA) and Spectral-Domain Optical Coherence Tomography (SD-OCT) features in a consecutive series of eyes affected with classic choroidal neovascularization (CNV) due to age-related macular degeneration (AMD) before and after anti-VEGF therapy.

Methods: Retrospective interventional study. All consecutive patients with newly diagnosed classic CNV and treated by intravitreal ranibizumab injection on “as needed” basis, were analyzed. Combined FA and SD-OCT examination (Spectralis HRA-OCT Heidelberg Engineering, Heidelberg, Germany) was performed at baseline and at the 12-month follow-up visit.

Results: Twenty-nine treatment-naïve eyes (29 patients, 10 males, 19 females, mean age 76.2±10.86) were included. A mean of 5.3±5.5 injections was administered during 12 months. At month-12, patients showed improved BCVA (p=0.01), a reduction of linear dimension of the entire lesion on FA (p=0.02), and a reduction of the lesion width on SD-OCT (p<0.001).

At baseline and in all cases, SD-OCT showed a highly reflective subretinal lesion, above and separate from the retinal pigment epithelium (RPE) layer. The highly reflective subretinal lesion showed a significant reduction of width at month-12 (p<0.001). A small “discreet” pigment epithelium detachment (PED) associated with the highly reflective subretinal lesion was present in 28/29 eyes at baseline and after treatment (at month-12).

Conclusions: A “discreet” PED represents a common associated finding of classic CNV. This study demonstrate that anti-VEGF treatment may not only stop the growth of the highly reflective subretinal lesion that co-localize with the classic CNV, but even determine the regression of the lesion.

Commercial Relationships: Karin Atmani, None; Giuseppe Querques, None; Florence Coscas, None; Raimondo Forte, None; Terrada Celine, None; Gabriel Coscas, None; Eric H. Souied, None

Support: None

Program Number: 1674 Poster Board Number: A69
Presentation Time: 1:45 PM - 3:30 PM

Treatment of Sub-macular Hemorrhage in Age-related Macular Degeneration

Benjamin Y. Ebrahim, Lasmi Desivitity, Michael L. Lai. Ophthalmology, Georgetown University/Washington Hospital Center, Washington, DC.

Purpose: To evaluate the efficacy of intra-vitreal injection of anti-VEGF, pneumatic displacement with intravitreal tissue plasminogen activator (tPA), and pars plana vitrectomy (PPV) with intravitreal tPA in the treatment of sub-macular hemorrhage (SMH) in Age-related Macular Degeneration (AMD).

Methods: Retrospective Chart Review. Charts were reviewed for SMH detectable clinically by indirect ophthalmoscopy examination of at least 1 disc diameter (DD) documented and followed by IFAV. Patients were treated in a nonrandomized fashion with PPV/tPA (intra-vitreal-50µg), pneumatic displacement/tPA (intra-vitreal 50µg) or intra-vitreal anti-VEGF injection. The study was divided into 3 groups based on the treatment received. Outcome measures: final visual acuity, displacement of the hemorrhage, best visual acuity, and complications. Inclusion criteria: age of 18 or older, diagnosis of AMD associated with SMH, treatment with any the above modalities, follow-up of 6mos or greater. Exclusion criteria: SMH unrelated to AMD and follow up less than 6 months.

Results: Total of 32 eyes of 22 patients met the inclusion and exclusion criteria with a mean follow up of 22.6 months. In PPV/tPA group, fifty percent of patients (4/8) had improved visual outcomes, 12.5% of patients retained the same vision, and 37.5% patients had worsening of their visual acuities. In the pneumatic displacement with tPA group, 28.5% of patients had improvement in their visual acuity, 28.5% had no change in vision, while 43% experienced worsening in their visual outcomes. In the intra-vitreal injection of Anti-VEGF, 30% of patients improved, 40% were unchanged, and 30% had worsening in their final visual outcomes. There is no statistically significant difference in visual outcomes among the pneumatic displacement with tPA, PPV with tPA, or intra-vitreal injection of Anti-VEGF.

Conclusions: The prognosis of sub-macular hemorrhage in AMD is very poor, independent of the treatment approach. There is not statistically significant difference in visual outcomes among the pneumatic displacement with tPA, PPV with tPA, or intra-vitreal injection of Anti-VEGF. Even though PPV appears to be more effective at displacing the sub-macular hemorrhage with improvement in visual acuity, the visual improvement was not statistically or clinically significant.

Commercial Relationships: Benjamin Y. Ebrahim, None; Lasmi Desivitity, None; Michael M. Lai, None

Support: None
Program Number: 1676  Poster Board Number: A71
Presentation Time: 1:45 PM - 3:30 PM
Polyoidal Choroidal Vasculopathy: Simultaneous Indocyanine Green Angiography and Eye-TRACKed Spectral Domain Optical Coherence Tomography: Findings
Purpose: To describe simultaneous indocyanine green (ICG) angiographic and eye-TRACKed spectral domain optical coherence tomography (SD-OCT) findings in eyes with polyoidal choroidal vasculopathy (PCV).
Methods: Eleven eyes of 11 patients with PCV due to various different diagnoses were imaged with simultaneous ICG angiography and eye-TRACKed spectral domain optical coherence tomography (SD-OCT) findings in order to localize the polyoidal structures with respect to the retinal layers.
Results: Regardless of the underlying diagnosis, simultaneous ICG angiography and eye-TRACKed SD-OCT imaging localized the polyoidal structures of PCV to within larger type 1 neovascular complexes above Bruch’s membrane. In 10 eyes, PCV appeared to adhere to the undersurface of a retinal pigment epithelium (RPE) detachment. In 1 eye, the polyoidal structure was detected within the neurosensory retina having apparently eroded through the overlying RPE.
Conclusions: Simultaneous ICG angiography and eye-TRACKed SD-OCT demonstrate that PCV is a variant of the type 1 neovascular growth pattern occurring in a variety of different neovascularized maculapathies. As the polyoidal structures in PCV appear to originate from longstanding choroidal neovascularization, not from the normal choroidal vasculature, PCV would be more accurately described as a choriodopathy rather than a choroidopathy.
Commercial Relationships: Samira Khan, None; K Bailey Freund, None; Yuata Imamura, None
Support: None

Program Number: 1677  Poster Board Number: A72
Presentation Time: 1:45 PM - 3:30 PM
Assessment of Effectiveness of “The Acrysof IQ Intraocular Lens” In Retarding The Progression Of Age-related Maculopathy
Vasuki Gonna Jothi1, Shana Subbiah2, Vittorio Silvestri3, A Jonathan Jackson3, Giuliana Silvestri4. 1Ophthalmology, Royal Victoria Hospital, Belfast, United Kingdom; 2Ophthalmology, Royal Victoria Hospital, Belfast, United Kingdom; 3Center for Vision and Vascular Science, Queen’s University Belfast, Belfast, United Kingdom.
Purpose: Recent studies have suggested that rate of progression of Age-Related Maculopathy (ARM) is likely to increase following cataract surgery. It has been proposed that excess exposure to “blue or violet-light” following cataract surgery may result in accelerated progression of ARM. Our group performed an observational pilot study to test this hypothesis by implanting a “blue-light” filtering IOL (Alcon Acrysof SN60WF) and a standard “UV” filtering IOL (Alcon Acrysof SA60AT) in each eye of patients with early ARM to determine the rate of progression in each eye. We also sought to assess the impact of this “blue-light” filtering IOL on visual function in patients with ARM in dim light.
Methods: Both eyes of 7 patients with stage 2a-3 ARM were implanted with identical hydrophobic acrylic IOLs: one eye with a SN60WF and the other with the SA60AT within 6 weeks. Progression of ARM was assessed using Rotterdam AMD grading scale and total drusen area count. Visual function in mesopic conditions was assessed using Vector Vision CSV 1000 EDTRS charts. Macular pigment was measured using SD-OCT imaging at baseline and at 30 months using Kuman spectroscopy.
Results: Seven patients were recruited 5 were suitable for analysis. The mean follow-up period was 33 months. Retinal imaging was available pre and post surgery at 1, 18 and 30 months. All 5 patients showed progression of ARM in both eyes, 4 patients showed more progression in the eye with ARM in dim light. The 5th showed more progression in the eye with ARM. Spectral domain OCT (SD-OCT) between visits 1 and 2 but between visits 2 and 3 showed some regression. Macular pigment measurement at 30 months in 4 patients revealed that in all 4 of them, there is a difference between both eyes with the eye being implanted with SA60AT having the higher macular pigment density. Visual function assessment showed that contrast sensitivity and colour vision were reduced in both eyes implanted with the SN60WF lens. Statistical tests have not been applied to these figures due to small number of patients.
Conclusions: Although the numbers are small, our data suggests that blue filtering lenses are not protective for ARM progression and may reduce visual function in patients with ARM.
Commercial Relationships: Vasuki Gonna Jothi, None; Shana Subbiah, None; Vittorio Silvestri, None; A Jonathan Jackson, None; Giuliana Silvestri, None
Support: Alcon

Program Number: 1678  Poster Board Number: A73
Presentation Time: 1:45 PM - 3:30 PM
A Retrospective Study of Changes in Macular Structure and Function in Patients with Neovascular Age-Related Macular Degeneration Prior to Commencing Ranibizumab Therapy
Sylvia Marchi1, Simona degli Esposti2, Pearse A. Keane3, Fred K. Chen3, Adnan TajfDal4, Praven J. Patel5. 1Ophthalmology, NIHR Biomedical Research Centre for Ophthalmology (Moorefield Eye Hospital and UCL Institute of Ophthalmology), London, United Kingdom; 2Lions Eye Institute, Perth, Australia.
Purpose: Describe changes in visual acuity and macular thickness in patients with neovascular age-related macular degeneration (nAMD) prior to initiating ranibizumab therapy and to describe the 12 month outcomes of therapy in this cohort.
Methods: Retrospective non-interventional case series of 92 consecutive patients commencing treatment for nAMD with ranibizumab in 2008. The visual acuity and spectral-domain optical coherence tomography retinal thickness were recorded at the diagnosis, at the first injection visit and after one year as were demographic data and lesion sub-type.
Results: The mean (range) age of patients was 78 (46-99) years with 33 (56%) females and 26 (44%) right eyes. There were 14 (24%) patients with classic or predominantly classic lesions with 45 (76%) with minimally classic or occult lesions. The mean (median) time to treatment from diagnosis was 55 days (45). The mean (SD) change in visual acuity and central macular thickness (CMT) between diagnosis and treatment was -3 (15) letters and +37 (66) μm respectively. There were 18 (31%) patients with a 10 or more letter loss of vision (treatment initiated in less than 4 weeks in 2 of these patients) with 8 (14%) with a 100 μm or more increase in CMT prior to commencing treatment. For the 14 (24%) patients treated within 4 weeks of diagnosis, there were 10 (22%) patients gained 10 or more letters (mean change +19 letters from first injection to one year). In this subgroup, 5 (28%) patients gained 10 or more letters from initial diagnosis to one year (mean change -0.2 letters).
Conclusions: This was a historical study of patients with nAMD at the time when ranibizumab therapy was being introduced into clinical practice. Adverse changes in macular structure and function were observed in patients between diagnosis and initiation of ranibizumab therapy in this cohort of patients with nAMD. This work reinforces the need for prompt treatment of this condition.
Commercial Relationships: Sylvia Marchi, None; Simona degli Esposti, None; Pearse A. Keane, None; Fred K. Chen, None; Adnan Tajfal, Allergan (C), Bayer (C), GSK (C), Novartis (C); Praven J. Patel, Allergan (R), Novartis UK (R)
Support: None

Program Number: 1679  Poster Board Number: A74
Presentation Time: 1:45 PM - 3:30 PM
Two-year Follow-up Of Subfoveal Pigment Epithelial Detachment In Eyes With Age-related Macular Degeneration And Visual Acuity Better Than 20/40 Takayuki Baba, Masayasu Kitahashi, Mariko Kubota-Tanai, Emi Ohoka, Shuichi Yamamoto. Ophthalmology & Visual Science, Chiba Univ Grad School of Med, Chiba, Japan.
Purpose: To investigate the clinical course of subfoveal pigment epithelial detachments (PEDs) in eyes with age-related macular degeneration (AMD) and visual acuity better than 20/40.
Methods: Retrospective interventional case series. Thirty-seven eyes of 35 cases (men 29, women 6) were studied. The mean age of the patients was 67.7 years with a range from 53 to 81 years. This study was approved by the Institutional Review Board, and an informed consent was obtained from every patient. All cases had a subfoveal PED larger than one disc area, and all were diagnosed with exudative AMD. The cases were divided into three groups by the type of PED; non-vascularized PED (Group A, 14 eyes), vascularized PED including polypoidal vasculopathy (PCV, Group B, 15 eyes), and occult choroidal neovascularization (CNV, Group C, 8 eyes). The best corrected visual acuity (BCVA) was better than 20/40 in all eyes with a range of 20/20-20/40 (median, 20/30). The eyes were treated with intravitreal bevacizumab or ranibizumab when the BCVA decreased or metamorphopsia increased. The BCVA, central foveal thickness (CFT), and PED thickness measured by FD-OCT at baseline were compared to that two years after the initial presentation.
Results: The BCVA did not change in Group A, decreased from 0.06±0.11 to 0.33±0.50 logMAR units in Group B, and decreased from 0.09±0.12 to 0.67±0.79 logMAR units in Group C. The CFT and PED thickness did not change significantly in all groups. However, the number of cases with a completely resolved PED was significantly larger in Group B (5 cases, P=0.014). The number of cases requiring treatment was highest in Group C (7 cases, P=0.022). The mean number of injection was 3.0 in Group A, 4.0 in Group B, and 3.0 in Group C.
Conclusions: The BCVA is maintained in cases with non-vascularized PED regardless of the duration of the PED, while one-half of the cases with vascularized PED had BCVA worse than 20/40 at the two year follow-up. The clinical course of subfoveal vascularized PEDs with good BCVA is different from that in eyes with non-vascularized PEDs.
Commercial Relationships: Takayuki Baba, None; Masayasu Kitahashi, None; Mariko Kubota-Tanai, None; Emi Ohoka, None; Shuichi Yamamoto, None
Support: Japan Society for the Promotion of Science, Grant-in-aid for Young Scientists (Start-up) 22890028
Program Number: 1680 Poster Board Number: A75
Presentation Time: 1:45 PM - 3:30 PM

Safety Testing of Epimacular Brachytherapy using Microperimetry
Robert Petrarca¹, Matthew Richardson², Jeffrey A. Nau, Timothy L. Jackson¹
¹Ophthalmology, King's College Hospital NHS Foundation Trust, London, United Kingdom; ²Clinical Affairs, NeoVista Inc, Newark, AZ.

Purpose: To test retinal sensitivity in patients undergoing epimacular brachytherapy for previously treated neovascular age-related macular degeneration (nAMD).

Methods: A prospective study of 12 subjects enrolled on the MERITAGE study at one UK site. At baseline, subjects underwent para plana vitrectomy and 24 Gray epimacular brachytherapy using a Strontium-90 source (NeoVista, Newark, CA). Patients received ranibizumab therapy monthly if predefined retreatment criteria were met. Microperimetry (MP-1; Nidek Technologies, Padova, Italy) was performed pre-operatively and at month 12.

Results: Mean age was 75 (SD 8) years. ETDRS VA remained stable over 12 months (-0.33 letters; SD 13.2; P=0.932) with a mean of 3.5 ranibizumab injections, including those given at baseline for pre-existing disease activity. Both mean sensitivity (MS) and mean defect improved slightly by 0.79 dB (SD, 3.92 dB; P=0.499) and 1.71 dB (SD, 4.26 dB; P=0.192) respectively. The mean in MS was evident in both with a mean improvement of 16.8 (SD, 3.17; P=0.357), and in neighbouring unaffected retina (0.65 dB; SD 4.23; P=0.606), as defined using fluorescein angiography and fundus photographs. Fixation stability and location were unaffected.

Conclusions: The fact that retinal sensitivity remained stable in areas not visibly affected by nAMD suggests that epimacular brachytherapy does not produce a deleterious effect in healthy retina.

Commercial Relationships: Robert Petrarca, NeoVista Inc (R); Matthew Richardson, None; Jeffrey A. Nau, NeoVista Inc (E); Timothy L. Jackson, NeoVista Inc (F, R).

Support: Research Grant: NeoVista Inc

Clinical Trial: http://www.clinicaltrials.gov, NCT00809419

Program Number: 1681 Poster Board Number: A76
Presentation Time: 1:45 PM - 3:30 PM

Improvements in Macular Function in Neovascular Age-related Macular Degeneration patients Treated with Ranibizumab
Laara Milner¹, Claudia Campa¹,², Richard P. Hagan¹,², Malcolm C. Brown¹, Simon P. Harding³
¹Clinical Eye Research Unit, Royal Liverpool University Hospital, Liverpool, United Kingdom; ²Eye and Vision Science, University of Liverpool, Liverpool, United Kingdom.

Purpose: To evaluate macular function changes in patients with neovascular age-related macular degeneration (nAMD) undergoing ranibizumab treatment over a period of 12 months.

Methods: Patients with nAMD were recruited into an observational longitudinal study and examined at baseline, 3, 6 and 12 months. The effect of ranibizumab anti-VEGF treatment upon macular function was assessed using multifocal electroretinography (mfERG) (Retiscan, Roland Consult) and microperimetry (MP-1)(Nidek). These were compared to the standard outcome measure of refraction protocol best corrected visual acuity (BCVA) measured on ETDRS charts.

Results: 14 patients were recruited. Mean mfERG P1 response amplitude from the central hexagon improved from the baseline value of 26.8 nV/deg to 47.5 nV/deg at 3 months, 42.6 nV/deg at 6 months and 38.6 nV/deg at 12 months (repeat-measure ANOVA, p=0.021). The mean P1 amplitudes from ring 2 and ring 3 of the mfERG did not change by a clinically significant amount over the 12 month period (ΔR2 < 4 nV/deg and ΔR3 < 2.5 nV/deg). There was no significant change in mean hexagon response latency over the 12 months.

Median visual acuity improved from 57.5 ETDRS letters at baseline to 69, 67 and 66 letters at 3, 6 and 12 months respectively (p=0.002). Mean retinal sensitivity inside the central 4 degrees improved from 2.8 dB at baseline to 6.7 dB, 5.6 dB and 5.9 dB at 3, 6 and 12 months respectively (p=0.007).

Conclusions: Central retinal function as measured by mfERG and MP1 significantly improved over a 12 month course of ranibizumab therapy and paralleled improvements in BCVA. Some subjects did not respond to treatment and further investigation into mechanisms of response is warranted. Measures of central function other than BCVA should prove useful in measuring treatment effects in future treatment trials.

Commercial Relationships: Laura Milner, None; Claudia Campa, None; Richard P. Hagan, None; Malcolm C. Brown, None; Simon P. Harding, None.

Support: None

Program Number: 1682 Poster Board Number: A77
Presentation Time: 1:45 PM - 3:30 PM

Progression Of Age-Related Geographic Atrophy: Role Of The Fellow-Eye
Arno P. Goebel¹, Monika Fleckenstein², Steffen Schmitz-Valckenberg¹, Christine Adirion³, Sivatharisesingam³, Christian Brinkmann³, Ulrich Mansmann³, Frank G. Holz³, FAM Study Group, ¹Department of Ophthalmology, University of Bonn, Bonn, Germany; ²Institute for Medical Information Sciences, Biometry and Epidemiology, University of Munich, Munich, Germany.

Purpose: To investigate if the stage of age-related macular degeneration (AMD) of the fellow eye is associated with atrophy progression over time in patients with geographic atrophy (GA) secondary to AMD.

Methods: A total of 300 GA eyes of 193 patients, recruited from the prospective FAM (Fundus Autofluorescence in age-related macular degeneration)-Study, were classified in 3 groups according to the AMD stage of the fellow-eye at baseline: (1) bilateral GA, (2) early AMD and (3) exudative AMD. GA areas of study eyes were quantified on fundus autofluorescence images using semi-automated image analysis and progression rates calculated using a 2-level linear mixed-effects model.

Results: At baseline, 148 patients belonged to group 1, 16 to group 2 and 29 to group 3, respectively. Univariate analysis showed an average population-specific progression rate of 1.64 mm/year (95% CI [1.478;1.803]) for group 1, 0.74 mm/year (95% CI [0.463;1.342]) for group 2 and 1.36 mm/year (99.37;1.787) for group 3. Although there was a statistical significant influence of the size of baseline atrophy on GA progression rate (conditional F-test: p=0.001), adjustment for this parameter still revealed a statistical significant relationship between the disease status of the fellow eye and atrophy enlargement over time (conditional F-test: p=0.033).

Conclusions: The (GA) secondary to AMD at baseline, non-SIVATARENE examination is associated with atrophy enlargement and thus the extension of corresponding absolute scotoma over time. This may indicate manifestation-dependent disease activity. The identification of prognostic determinants on atrophy progression may not only help to add to our understanding of underlying pathophysiological mechanisms, but also for the design of future interventional trials in GA patients.

Commercial Relationships: Arno P. Goebel, Heidelberg Engineering (F); Monika Fleckenstein, Heidelberg Engineering (R), Heidelberg Engineering, Optos Ltd. (F); Steffen Schmitz-Valckenberg, Heidelberg Engineering (R), Heidelberg Engineering, Optos Ltd., Optos UK (F); Christine Adirion, None; Sivatharisesingam, Heidelberg Engineering (F); Christian Brinkmann, Heidelberg Engineering (F); Ulrich Mansmann, None; Frank G. Holz, Heidelberg Engineering (R), Heidelberg Engineering, Carl Zeiss Meditec AG (C), Heidelberg Engineering, Optos Ltd. (F).

Support: SFP 1088, Ho 1926/1-3, Ho 1926/1-3, Ma 1723/1-1

Clinical Trial: http://www.clinicaltrials.gov, NCT00393692

Program Number: 1683 Poster Board Number: A78
Presentation Time: 1:45 PM - 3:30 PM

Efficacy of Intravitreal Ranibizumab for Choroidal Neovascularisation Secondary to Age-Related Macular Degeneration: First Eye vs Second Eye Affected
Leena Bhat, Manju Chandran, Geeta Menon. Ophthalmology, Frimley Park Hospital NHS Foundation Trust, Camberley, United Kingdom.

Purpose: To investigate predictive factors of efficacy of intravitreal ranibizumab in patients with choroidal neovascularisation (CNVM) secondary to age-related macular degeneration, as measured by changes in visual acuity (VA) and central macular thickness (CMT). In an attempt to identify if there was a role for screening patients in our centre, we tested the hypothesis that patients presenting with 2nd eye involvement have better response than those presenting with 1st eye involvement, due to early presentation and early treatment.

Methods: A retrospective study was conducted of patients treated with Ranibizumab for CNVM and followed up for 54 weeks (n=62). Patients were divided into 2 groups: '1st eye affected’ were those with no previous CNVM who presented for the 1st time (n=31); ‘2nd eye affected’ were those with previous CNVM in one eye who then presented with CNVM in the 2nd eye (n=31). VA was measured using the Early Treatment Diabetic Retinopathy Study (ETDRS) score and CMT using optical coherence tomography (OCT) at baseline and 54 weeks.

Results: Mean change in VA (ETDRS letters) from baseline to 54 weeks was +7.52 for the 1st eye and +7.71 for the 2nd eye group. There was no significant difference between groups (p=0.153). Mean change in CMT was -31.5 μm for 1st eye and -56.28μm for the 2nd eye group. There was no significant difference between groups (p=0.880). 91.5% of the 1st and 96.2% of 2nd eye groups maintained/improved their vision at 54 weeks. 41.93% of the 1st and 22.58% of the 2nd eye groups improved their vision (gained more than or equal to 15 letters). Given the trend for 1st eye patients to have lower baseline VA and to achieve better VA change at 54 weeks, correlation between baseline VA and change in VA across all patients was tested and was significant (p=0.01).

Conclusions: The study did not support the hypothesis that patients presenting with 2nd eye affected by CNVM would achieve better VA or CMT change at 54 weeks post initiation of Ranibizumab therapy. The results in fact showed that, at 54 weeks, there was a significantly greater percentage of 1st eye patients whose VA improved (gained more than or equal to 15 letters) than 2nd eye patients (p=0.037).

Commercial Relationships: Leena Bhat, None; Manju Chandran, None; Geeta Menon, None.

Support: None

Copyright 2011 by the Association for Research in Vision and Ophthalmology, Inc., all rights reserved. For permission to reproduce any abstract, contact the ARVO Office at pubs@arvo.org.
Program Number: 1684 Poster Board Number: A79
Presentation Time: 1:45 PM - 3:30 PM
Low Visual Acuity and their Outcomes with intravitreal Ranibizumab
Cheryl C. MacGregor, Manju Chandran, Emily Turton, Jincy Jose, Geeta Menon. Ophthalmology, Frimley Park Hospital, Frimley, United Kingdom.
Purpose: The development anti-VEGF agents and their treatment effects for wet age-related Macular Degeneration (AMD) has possibly been the most remarkable break-through in Ophthalmology in recent years. However, it has come with a service burden and licensing restrictions. This study was performed to evaluate the visual outcomes in patients with low Visual Acuity (VA) receiving intravitreal Ranibizumab over the course of 12 months. Few studies have examined patients from a low VA baseline and we wanted to correlate our data with other Ranibizumab studies to determine whether this group of patients experienced similar benefits from Ranibizumab and whether these results were sustained. We also wanted to quantify whether there was an improvement or stabilization in vision acuity and average number of injections in a year at our Hospital.
Methods: Retrospective review of 49 eyes with AMD and baseline VA of 25 to 35 letters. Inclusion criteria were presence of exudative macular degeneration of all subtypes with less than 50% of the lesion being fibrosed. Treatment involved 3 consecutive injections of Ranibizumab 0.5mg at 4 weekly intervals and then as required for another 9 months. Outcome measures were change in visual acuity (VA) measured by Early Treatment Diabetic Retinopathy Study (ETDRS) charts and central macular thickness (CMT) at baseline and the end of 54 weeks.
Results: Mean age was 78.6 years and had a follow up period of 12 months. Mean visual acuity at baseline was 29.08±3.8 letters improving to 38.33±12.6 after 12 months. Mean Central macular thickness (6.7±1.9) at baseline was 297.5±50.5mm and decreased to 243.06±58.8. Mean number of injections was 6.7±1.9. There was a statistically significant improvement in visual acuity (p<0.01) as well as reduction in thickness (p<.001). 23 out of 49 patients (46.9%) showed a significant improvement in visual acuity while 13 out of 49 patients (26.5%) showed a significant reduction in thickness. Mean number of injections per patient in 12 months was 7 (with a range of 3 to 12 injections).
Conclusions: Intravitreal Ranibizumab injections do lead to an improvement in VA as well reduction in CMT that is sustained in patients with poor vision due to chronic AMD. However, this study has been carried on a small case series and would benefit from an increased sample size.
Commercial Relationships: Cheryl C. MacGregor, None; Manju Chandran, None; Emily Turton, Jincy Jose, Geeta Menon. None
Support: None

Program Number: 1685 Poster Board Number: A80
Presentation Time: 1:45 PM - 3:30 PM
Early Micropereimetric Retinal Sensitivity Responses to Ranibizumab Treatment in Patients with Wet Macular Degeneration
Richard B. Rosen1,2, Gennady Lands1,2, Julie Paul1, Kaye Tai1, Patricia M. Garcia1,2, Sokoleak So1. Ophthalmology, New York Eye & Ear Infirmary, New York, NY; 1Ophthalmology, New York Medical College, Valhalla, NY.
Purpose: To investigate the value of micropereimetric retinal sensitivity in monitoring therapeutic response in the first months of Ranibizumab treatment for choroidal neovascularization (CNV) in patients with age-related macular degeneration (AMD), compared to monitoring of changes in visual acuity and central retinal thickness.
Methods: Prospective case series of 8 patients with naive CNV secondary to AMD receiving monthly intravitreal ranibizumab (0.5mg/0.05 mL) injections during the first four months of treatment. Best-corrected visual acuity (BCVA), assessed using the Early Treatment Diabetic Retinopathy Study (ETDRS) chart, microperimetry (MP) and central retinal thickness (CRT), obtained using the OCT/SLO-MP (OPKO Health, Miami, Fla) were recorded at baseline and at months 1, 2, 3 and 4 follow-up examinations.
Results: Eight patients (age, 75.8±8.3 years; range, 57-88 years) were included. Mean BCVA was 62.4±18.8 letters (range, 33-91 letters) at baseline and 72.3±13.4 letters (range, 57-85 letters) (P=0.02) at month 4. Mean BCVA improved after 1st and 2nd injections and remained almost unchanged after 3rd and 4th injections. Mean MP scores were 8.1±1.9 (range, 7.0-16.1) at baseline and 11.5±5.5 (range, 1.25-16.25) (P=0.016) at month 4. Mean retinal sensitivity progressively improved during the first four months of treatment with the most significant increases of the mean MP scores being recorded following the 1st and 4th injections. Central retinal thickness decreased from 340.6±52.9 microns at baseline to 264.0±38.2 microns at 4 months (P<0.01). A monthly analysis of the mean CRT change showed substantial improvement following the 1st injection which remained essentially unchanged. Plots of mean MP and ETDRS scores showed significant correlation (r=0.69, P<0.001), as did MP and central macular thickness (r=0.528, P<0.01). Correlation between ETDRS score and central macular thickness was less significant (r=0.33, P=0.06).
Conclusions: Retinal sensitivity, in the first months of Ranibizumab therapy appears to continue to improve progressively with monthly treatments, while central retinal thickness and visual acuity improved following the first injection and remain almost unchanged afterwards. Microperimetry appears to correlate better with CRT than ETDRS. This study may provide better indication of retinal functional improvements in neovascular AMD patients treated with Ranibizumab. A larger study is in progress to confirm these findings.
Commercial Relationships: Richard B. Rosen, Clarity (C), Genentech (F), OD-Os (C), Opko-OTI (C), Topcon (R); Gennady Landa, None; Julie Paa, None; Kaye Tai, None; Patricia M. Garcia, Opko-OTI (C); Sokoleak So, None
Support: Genentech
Clinical Trial: http://www.clinicaltrials.gov, NCT#07.14

Program Number: 1686 Poster Board Number: A81
Presentation Time: 1:45 PM - 3:30 PM
Microperimetric Changes In Neovascular AMD Treated With Ranibizumab
Philip Alexander, Fizza Mushtaq, Winfried Aumoak. Ophthalmology, Nottingham University Hospitals, Nottingham, United Kingdom.
Purpose: Neovascular Age-related Macular Degeneration (nVAMD) is the commonest cause of visual loss in the Western World. Microperimetry, which assesses sensitivity of the central retina and allows automated functional analysis of the macula, is not currently in routine use in assessment of nVAMD patients. The Macular Integrity Assessment (MAIA) device, which utilises SLO technology, is a 3rd generation microperimetry device which has recently become available for clinical use. A pilot study was conducted to provide a preliminary assessment of its value in monitoring progress and assess any potential correlations with visual acuity and OCT findings in eyes treated with ranibizumab for nVAMD.
Methods: Patients attending the nVAMD Clinic between February and August 2010 were considered for inclusion in this study. All patients had previously been treated with intravitreal ranibizumab and were in the maintenance phase of therapy. Eyes that had significant media opacities were excluded. All patients underwent clinical assessment which included best corrected VA, fundal examination, OCT, and MAIA microperimetry. Intravitreal ranibizumab was administered as clinically necessary. Threshold sensitivity (TS) and fixation stability analysis (FS) from microperimetry were compared with OCT findings. For this case series, patients were included only if they had at least 3 measurements repeated at minimum intervals of 1 month or more.
Results: 21 eyes of 14 patients (6 male, 8 female) were included in the study. Of 21 eyes, 17 eyes had stable OCT findings and central retinal thickness variability <10% in 2 weeks. In these eyes, FS was unchanged from baseline in 15/17 eyes. However FS improved in 5 patients, worsened in 6 patients, and remained stable in 6 patients. In 2/21 eyes that worsened over the study period on OCT, TS and FS worsened. In 2/21 eyes that improved over the study period, TS was unchanged but FS improved in 1 eye and remained stable in 1 eye.
Conclusions: Threshold sensitivity on microperimetry correlates well with anatomical macular integrity in treated nVAMD patients. Eyes in stable nVAMD, TS remains stable but FS may improve, worsen or remain unchanged. Changes in FS may represent retinal remodelling or subclinical worsening of the disease process and this warrants further investigation.
Commercial Relationships: Philip Alexander, None; Fizza Mushtaq, None
Support: None

Program Number: 1687 Poster Board Number: A82
Presentation Time: 1:45 PM - 3:30 PM
A Novel Method for Determining Choroidal Neovascularization Volumes in Vivo
Thomas D. Olsen1,2, Ping Luo1,3, Ronnie Archer1,4, Kyle Jackman1,4, Ying Liu1,4, Krysten Zygmunt1,2, Ross Whitaker1,2, Balamurali K. Ambati1,4, Philip Alexander1, Ying Liu1,4, Ross Whitaker1,2, Balamurali K. Ambati1,4, Philip Alexander1, Ying Liu1,4, Ross Whitaker1,2
Purpose: Choroidal neovascularization (CNV) volumes calculated by laser confocal microscopy combined with immunostaining is the most common method for CNV analysis. However, it only can be used in vitro and the CNV base line cannot be evaluated. We developed new software, Seg3D, (University of Utah Center for Biomedical Computing) and determined if it can be used for in vivo CNV volume calculations.
Methods: Laser induced CNV and aav.shRNA.sflt subretinal injection induced CNV were developed in C57BL6J mice as CNV models. After 2 weeks-6 months, CNV was imaged by OCT & FA using Heidelberg Eye Explorer Spectralis HRA+OCT II and subsequently exported into the Seg3D program. The scaling factors for each dimension, x, y & z (pixel), were recorded and the correlation coefficient standard was changed from 7.7 to 1.75. Each lesion area, on 2 dimensional images, was outlined using the provided polyline tool in Seg3D. The total number of voxels inside the identified regions were counted and reported by Seg3D. The volume of each OCT image stack was calculated and then normalized by multiplying the number of voxels by the scaling factors for each dimension. Mice were euthanized and prepared for IBC staining immediately after Spectralis images were taken. The same CNV lesions were calculated using scanning laser confocal microscope after immunohistochemistry staining (Isocetin alexa fluor 546, invitrogen), as usual. The same x stack size was used by both methods. Microsoft Excel was used to analyze the volume calculations of each method as well as the correlation statistic and average difference.
Results: The CNV volume calculated using Seg3D (3.03±10±6µm3) was, on average, 2.5 times larger than the volumes (1.21±10±6µm3) calculated using the laser confocal microscope (n=19, P=0.0006). The correlation statistical analysis showed 0.76 correlation between these two methods.

Copyright 2011 by the Association for Research in Vision and Ophthalmology, Inc., all rights reserved. For permission to reproduce any abstract, contact the ARVO Office at pubs@arvo.org.
Correlation Between Change In Visual Acuity (va) And Lesion Size After Two Regimes Of Intravitreal Bevacizumab In Age Related Macular Degeneration (armd) With Minimally Classic And Occult Choroidal Neovascularisation

Nitin Jain, Manju Chandran, Sr., Narendran Nair, Gulrez Ansari, Leena Bhat, Lorraine North, Emily Turton, Geeta Menon. Ophthalmology, Frimley Park Hospital NHS Foundation Trust, Camberley, United Kingdom.

Purpose: To investigate the correlation between change in VA and lesion size after two regimes of intravitreal Bevacizumab in ARMD with Minimally Classic and Occult choroidal neovascularisation.

Methods: Retrospective review of 88 eyes (87 patients) treated with intravitreal injection of Bevacizumab were randomised into two groups. Group I had intravitreal Bevacizumab 1.25mg administered 6 weekly for three visits and then Pro Re Nata (PRN). Group II had intravitreal Bevacizumab PRN after the first dose. Follow up was 6 weekly for a period of 1 year. Changes in VA as measured by Early Treatment Diabetic Retinopathy Study (ETDRS) charts at baseline and after 12 months were analysed. We also compared the differences in the lesion size before and after treatment. In addition we examined the correlation of the change in VA with lesion size.

Results: Mean change in VA before and after treatment showed a 0.66 improvement for Group 1, and 2.41 deterioration for Group 2. Visual acuity before and after treatment was not significantly different for either group (Group 1: \( p=.767 \); Group 2: \( p=2.32 \), paired t-test). Mean change in lesion size before and after treatment showed an improvement, reducing by 1.87 in Group 1 and 3.00 in Group 2. Lesion size for both groups was significantly reduced (Group 1: \( p<.001 \); Group 2: \( p<.001 \), Wilcoxon signed ranks test). A correlation was observed between the change in VA and change in lesion size for Group 1, but not Group 2 (Group 1: \( r = -0.352, p<.05 \); Group 2: \( r = 0.22, p = 0.52 \), Pearson's correlation).

Conclusions: VA showed improvement in Group I with significant reduction in lesion size. In addition a correlation was observed between the change in VA and lesion size in Group 1. In our small study Group I with initial loading dose was more effective than Group 2.

Commercial Relationships: Nitin Jain, None; Manju Chandran, Sr., None; Narendran Nair, None; Gulrez Ansari, None; Leena Bhat, None; Lorraine North, None; Emily Turton, None; Geeta Menon, None

Support: None