AMD

14**Status of the Outer Layers of the Retina and Especially CNV at High Pigment Epithelium Detachment***Ural Rifovich Altynbaev*

Medical center OJSC Tatneft, Almetjevsk, Russia

Introduction: To study the morphological features of CNV with high PED in patients with AMD.

Methods or Study Design: A comparative morphological study of the retinal pigment epithelium, Bruch's membrane and CNV in 10 patients with the wet form of AMD. A study group of the research consisted of 4 patients with high PED and removed 'occult' CNV. In the control group 6 patients with 'classical' CNV were considered. In all cases of CNV collagen type I, II, glycosaminoglycans were determined, which may affect the local pharmacokinetics.

Results: CNV at high PED represented itself a hearth of chronic granulomatous inflammation with narrowed blood vessels, lined with high endothelial layer having an increased bandwidth. The average thickness of the pigment layer of the retina in patients with PED amounted to -16.08 ± 4.64 mm, which is 30% more than those in the control group (11.22 ± 3.38) ($p < 0.05$). The average thickness of Bruch's membrane in the main group (6.7 ± 0.19 mm) was also higher than – in the control (5.7 ± 3.8 mm) ($p < 0.05$). The histochemical study revealed qualitative differences between the groups of patients at the determination of type I and type III collagens. In the 'classical' CNV they were absent, whereas in Bruch's membrane of patients with 'occult' CNV type I collagen was observed. Glycosaminoglycans were found only in the group with 'classical' CNV.

Conclusions: The development of high PED in patients with AMD, may be due to the process of expressed exudative reaction of the newly formed and choroidal blood vessels accompanied by chronic granulomatous inflammation. The thickening of Bruch's membrane in patients with high PED was found to be due to deposition of collagen type 1 on the external surface of the membrane, which in turn causes a violation of local hydrodynamics and bio mobility of pharmacological agents.

Acknowledgements: Medical center OJSC Tatneft.

Keywords: Age-Related Macular Degeneration, High Pigment Epithelium Detachment, Choroidal Neovascularization.

17**Short Term Effect of Choroidal Thickness in Age Related Macular Degeneration Treatment***Handan Bardak, Yavuz Bardak*

Isparta Career Eye Hospital, Isparta, Turkey

Introduction: The aim of study was to investigate effect of choroidal thickness on intravitreal bevacizumab (IVB) treatment in age related macular degeneration (ARMD) patients.

Methods or Study Design: Thirty-nine patients with exudative ARMD had 3 times IVB injections with 1 month interval. Corrected visual acuity (CVA), subfoveal choroidal thickness (SFCT), central macular thickness (CMT) measurements and ocular examinations were performed before and after 3 monthly IVB injections. Patients having >100 micron decrease in CMT after 3 monthly IVB injections were accepted as responsive (Group 1) while the others were accepted as non-responsive (Group 2).

Results: There were 18 (46.2%) male, 21 (53.8%) female patients with a mean age of 71.49 ± 6.27 years (60–83 years). Before IVB injections SFCT was 239.82 ± 43.83 μ m in Group 1 and 172.06 ± 28.22 μ m in Group 2. After 3 monthly IVB injections SFCT was 208.41 ± 41.65 μ m in Group 1 and 164.18 ± 20.72 μ m in Group 2. Before IVB injections CVA was 0.80 ± 0.46 logMAR in Group 1 and 1.12 ± 0.62 logMAR in Group 2. After 3 monthly IVB injections CVA was 0.55 ± 0.40 logMAR in Group 1 and 0.99 ± 0.63 logMAR in Group 2. SFCT measurements were higher in Group 1 than Group 2 both pretreatment and after 3 monthly IVB injections (respectively $p:0.001$, $p:0.001$). Decrease in SFCT and improvement in CVA were higher in Group 1 than Group 2 after 3 monthly IVB injections (respectively $p:0.001$, $p:0.011$).

There was a negative correlation between SFCT and CVA for pretreatment measurements and after 3 monthly IVB injection measurements (respectively $p:0.001$, $p:0.001$).

Conclusions: Choroidal thickness may have effect on IVB treatment of ARMD patients.

Acknowledgements: There is not any financial interest of authors for this study.

Keywords: Age Related Macular Degeneration, Bevacizumab, Choroidal Thickness, Optical Coherens Tomography.

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OCEAN: First 2-Year Results of Patients with Neovascular Age-Related Macular Degeneration after Completed Patient Recruitment

Martin Scheffler¹, Steffen Schmitz-Valckenberg², Focke Ziemssen³, Sandra Liakopoulos⁴, Georg Spital⁵, Thomas Bertelmann⁶, Frank G. Holz²

¹MCR-Medical Center, Rhauderfehn, Germany; ²University Eye Hospital, Bonn, Germany; ³University Eye Hospital, Tübingen, Germany; ⁴CIRCL Reading Center, Department of Ophthalmology, University of Cologne, Germany; ⁵Eye Clinic, St. Franziskus Hospital, Münster, Germany; ⁶University Eye Hospital, Marburg and Novartis Pharma GmbH, Nuremberg, Germany

Introduction: The non-interventional OCEAN study is the largest ophthalmic study conducted in Germany to evaluate the real world situation of patients being treated with ranibizumab.

Methods or Study Design: During the observation period of up to 24 months the recorded parameters include: number of visits, visual acuity, central retinal thickness (CRT), optical coherence tomography (OCT), fluorescein angiography (FA), and ranibizumab injections. All treatments including diagnoses and monitoring are performed according to routine practice management and the assessment of the investigator. The statistical analysis is purely descriptive.

Results: A total of 3,614 patients with nAMD were included. Follow-up 1-year/2-year data is available for 1,768 (49%)/617 (17%) patients. The mean best corrected visual acuity (BCVA) at baseline was 52.0 ± 21.3 ETDRS letters ($n = 3,585$). After 1 year, the BCVA had improved to 55.2 ± 23.7 ETDRS letters ($n = 1,240$), after 2 years had stabilized at 52.0 ± 27.4 ETDRS letters ($n = 431$). OCT was performed in 2,784 patients (77%) at baseline, with a mean CRT of $367.1 \pm 133.2 \mu\text{m}$ ($n = 2,372$). CRT had declined to $274.5 \pm 96.0 \mu\text{m}$ ($n = 501$) after 1 year and to $264.0 \pm 83.5 \mu\text{m}$ ($n = 167$) after 2 years. FA was performed in 2,463 patients (68%) at baseline, with neovascular activity in 2,336 patients (95%). At month 12, FA was performed in 54 patients (4%), with activity in 26 patients (48%). At month 24, FA was performed in 15 patients (3%), with activity in 4 patients (27%). The mean number of injections per patient during the observation period was 4.71 ± 3.15 .

Conclusions: Overall, tendencies can be seen towards a stabilized BCVA and a declined CRT despite likely undertreatment. A decreased percentage of activity was shown, although FA was not often performed. So far, effectiveness of ranibizumab for the indication nAMD could be shown without new safety issues. For this ongoing study, further long-term results are expected.

Keywords: Neovascular Age-Related Macular Degeneration (NAMD), Non-Interventional Study, Ranibizumab.

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Long-Term Clinical Evolution of Neovascular Age-Related Macular Degeneration Patients Treated with Ranibizumab in Real World

R. Gallego¹, B. Romero², M. Balaña², On Behalf of Relap Study Investigators

¹Hospital Universitario La Fe, Valencia, Valencia, Spain;

²Novartis Farmacéutica, S.A., Barcelona, Barcelona, Spain

Introduction: Several clinical trials had showed improved visual outcomes in neovascular age-related macular degeneration (nAMD) after 3 loading doses and then ongoing monthly, Pro Re Nata (PRN) or Treat and Extend (T&E) treatment with ranibizumab (Lucentis®). However, optimal long standing treatment strategy remains undefined. We aim to study long-term evolution of visual acuity (VA) in nAMD patients treated with ranibizumab for at least 24 months in clinical practice.

Methods or Study Design: Clinical and demographic characteristics were retrospectively collected from medical records of nAMD patients treated with ranibizumab 0.5 mg and followed ≥ 24 months. 10 specialist sites in Spain participated. Inclusion criteria: ≥ 50 years old; VA $\geq 20/200$ in the previous 3 months of data collection from June-December 2013.

Results: 67 eyes were evaluated (66 patients, mean age 78.2 [standard deviation (SD) 6.3]; women 50%) Mean time from nAMD diagnosis was 3.1 years [SD 0.8]. 65.7% of affected eyes had received a loading dose of 3 consecutive monthly injections of ranibizumab. Mean VA improved +3.7 [SD 12.0] letters at 12 months and +4.2 [SD 12.3] at 24 months after diagnosis. VA improvement after loading dose (month 3) was more sustained in ≤ 75 years old, ≤ 3 years since diagnosis and $>$ central retinal thickness (CRT) patients. PRN with monthly follow-up (43.3%; mean annual injections 4.2 [SD 1.6]) and PRN without fixed follow-up criteria (43.3%; 2.7 [SD 1.3]) were the most common treatment follow-up strategies. Ranibizumab was administered in 61/67 eyes after recurrence, with presence of persistent or recurrent intra/subretinal fluid the most common retreatment criteria, regardless of age, time since diagnosis, VA or CRT.

Conclusions: In real world clinical practice ranibizumab improved VA since month 3, remaining stable in long-term (24 months). Younger age, less time since diagnosis and superior basal CRT were associated with a better maintenance of VA improvement.

Acknowledgements: The authors thank TFS for the medical writing support.

Keywords: Neovascular Age-Related Macular Degeneration, Visual Acuity, Ranibizumab, Real-World Clinical Practice, Intra-vitreal Injections.

Analysis of Pigment Epithelium Detachments in Exudative Age-Related Macular Degeneration Treated with Aflibercept: Predictive Factors for Visual Outcome

Verónica Castro-Navarro¹, Enrique Cervera-Taulet²,
Javier Montero-Hernández², Catalina Navarro-Palop²,
Francisco Javier Romero-Gómez³

¹Hospital General Universitario de Valencia, Escuela de Doctorado, Universidad Católica de Valencia San Vicente Mártir, Valencia, Valencia, Spain; ²Hospital General Universitario de Valencia, Valencia, Valencia, Spain; ³Escuela de Doctorado, Universidad Católica de Valencia San Vicente Mártir, Valencia, Valencia, Spain

Introduction: The purpose of this study is to explore the predictive factors for visual outcome in exudative-AMD associated with pigment epithelium detachments (PED) treated with aflibercept.

Methods or Study Design: A retrospective study was conducted on patients diagnosed with exudative AMD associated with PED and treated with three consecutive monthly intravitreal injections of aflibercept. Patients underwent LogMAR-best corrected visual acuity (BCVA) (ETDRS) and Spectral-domain-optical-coherence-tomography (SD-OCT) 9x9 mm cube-scans (3D-OCT2000, TopCon) of the macular area. A well trained technician manually measured PED height (at point of maximum height, subfoveal, 500 μ nasal and 500 μ temporal). PED was classified into serous (hyporeflective) or fibrovascular (hyperreflective). The presence/absence of subretinal fluid (SRF) and intraretinal fluid (IRF) was also documented. A Wilcoxon-test or Spearman's rank correlation coefficient were used with statistical significance defined as $p < 0.05$.

Results: Ten eyes were analyzed. After treatment, BCVA increased from 0.66 to 0.52 ($p = 0.607$). BCVA improves 3 lines or more in 40% ($n = 4$) of the patients, decreased in 20% ($n = 2$) and remained stable in 40% ($n = 4$). A decreased in central macular thickness (CMT) (308.6 ± 71.15 to 244 ± 46.63 ; $p = 0.032$) and macular volume (MV) (8.39 ± 1.06 to 6.97 ± 0.56 ; $p = 0.011$) were observed. Percentages of initial SRF (90%) and IRF (50%) changed to 10% and 0% respectively after the loading dose.

At baseline, 10% presented with fibrovascular PEDs and 90% with serous PEDs, changing to 60% and 40%, respectively. A decreased in PED height at all locations was observed. Preoperative-PED height were 265.2 ± 144.28 at maximum-height, 168.6 ± 157.22 subfoveal, 128.4 ± 106.1 nasal and 172.5 ± 180.68 temporal; postoperative measures were 198.5 ± 139.628 , 108.2 ± 137.31 , 112.6 ± 115.05 and 130 ± 125.88 , respectively ($p = 0.022$; $p = 0.139$; $p = 0.428$; $p = 0.401$).

Regarding visual outcome, a statistical strong correlation with preoperative subfoveal PED height ($R = 0.82$, $p = 0.003$) was found.

Conclusions: Intravitreal aflibercept seems to be an effective treatment of exudative-AMD associated with PED. The correlation of PED with visual outcome remains controversial. According to our data, only preoperative-subfoveal-PED seems to be a useful predictive factor for BCVA.

Acknowledgements: No financial disclosure.

Keywords: Pigment Epithelium Detachments, Age-Related Macular Degeneration, Aflibercept.

Anatomical Changes in SD-OCT in Exudative Age Related Macular Degeneration (AMD) Associated with Pigment Epithelium Detachment (PED) Treated with Aflibercept

Enrique Cervera-Taulet¹, Verónica Castro-Navarro²,
Javier Montero-Hernández¹, Catalina Navarro-Palop¹,
Francisco Javier Romero-Gómez³

¹Hospital General Universitario de Valencia, Valencia, Valencia, Spain; ²Hospital General Universitario de Valencia, Escuela de Doctorado, Universidad Católica de Valencia San Vicente Mártir, Valencia, Valencia, Spain; ³Escuela de Doctorado, Universidad Católica de Valencia San Vicente Mártir, Valencia, Valencia, Spain

Introduction: The purpose of this study is to evaluate anatomical outcomes on Spectral-domain-optical-coherence-tomography (SD-OCT) in response to aflibercept in exudative age-related macular degeneration (AMD) associated with pigment epithelium detachment (PED).

Methods or Study Design: A retrospective study was conducted on patients diagnosed with exudative-AMD associated with PED and treated with three consecutive monthly intravitreal injections of aflibercept. Patients underwent LogMAR-best corrected visual acuity (BCVA) (ETDRS) and SD-OCT 9x9 mm cube-scans (3D-OCT2000, TopCon) of the macular area. A well trained technician manually measured PED height (at point of maximum height, subfoveal, 500 μ nasal and 500 μ temporal). PED was classified into serous (hyporeflective) or fibrovascular (hyperreflective). The presence of subretinal fluid (SRF) and intraretinal fluid (IRF) were graded by 0 (absent) and 1 (present). A Wilcoxon-test or Spearman's rank correlation coefficient were used with statistical significance defined as $p < 0.05$.

Results: Twenty-three eyes ($n = 10$ naive, and $n = 13$ refractory to others antivasular-endothelial-growth-factors treatments) were analyzed. During the course of loading-regime, BCVA improved from 0.51 ± 0.3 LogMar to 0.53 ± 0.34 ($p = 0.703$) and CMT decreased from $299.21 \pm 52.72 \mu$ to $245.04 \pm 46.54 \mu$ ($p = 0.000$). Similarly, MV decrease from $7.87 \pm 0.91 \text{ mm}^3$ to $7.01 \pm 0.49 \text{ mm}^3$ ($p = 0.000$). SRF was present in 69.6% ($n = 16$) before treatment, and decreased to 30.4% ($n = 7$) at 12 weeks. On the same way, IRF changed from 34.8% ($n = 8$) to 13% ($n = 3$) at final examination.

Of all eyes evaluated at baseline, 21.7% ($n = 5$) presented with fibrovascular PEDs and 78.3% ($n = 18$) with serous PEDs. At baseline, PED height were $309.08 \pm 172.84 \mu$ at maximum height, $203.60 \pm 128.52 \mu$ subfoveal, $153.52 \pm 112.16 \mu$ nasal and $215.78 \pm 164.7 \mu$ temporal. Postoperative-PED measures were $264.04 \pm 183.05 \mu$ at maximum height, $155.26 \pm 142.42 \mu$ subfoveal, $131.95 \pm 119.23 \mu$ nasal and $214.43 \pm 192.16 \mu$ temporal ($p = 0.009$; $p = 0.010$; $p = 0.153$; $p = 0.741$, respectively). A clinically detectable retinal pigment epithelium tear occurred in 8% ($n = 2$) of patients with mean preoperative-maximum-PED height of 290 μ and 399 μ .

Conclusions: Intravitreal injections of aflibercept constitute an efficacious and safe treatment for exudative-AMD-PED. A decrease in retinal thickness, presence of fluid and PED height at all locations are observed after a loading-dose-regime.

Acknowledgements: No financial disclosure.

Keywords: Pigment Epithelium Detachment, Age-Related Macular Degeneration, Aflibercept.

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Three-Year Results of Combined Intravitreal Anti-VEGF and Photodynamic Therapy for Early Stage Retinal Angiomatous Proliferation: Comparison with Anti-VEGF Monotherapy

Junyong Kim, Wonki Lee

Seoul St. Mary's Hospital, Seoul, Korea

Introduction: To compare treatment outcomes of photodynamic therapy (PDT) combined with anti-vascular endothelial growth factor (VEGF) therapy and anti-VEGF monotherapy for early stage retinal angiomatous proliferation (RAP).

Methods or Study Design: A total of 48 eyes of 41 patients with stage 1 or 2 treatment-naïve RAP were retrospectively reviewed. For initial treatment, 20 eyes received combination therapy of PDT and anti-VEGF (combination group) and 28 eyes received three consecutive anti-VEGF injections (monotherapy group). All patients were followed and retreated by an as-needed anti-VEGF re-injection schedule. The main outcomes measured were the change in best-corrected visual acuity (BCVA), the recurrence rate and the number of reinjection, and the rate of geographic atrophy (GA) development through 3 years of follow-up.

Results: The mean logarithm of the minimal angle of resolution (log MAR) BCVA significantly improved at 1 year both in combination group (0.62 to 0.48, $p = 0.002$) and monotherapy group (0.52 to 0.41, $p = 0.013$). Over the 3-year follow-up period, 9 eyes (45.0%) were free from recurrent fluid accumulation in the combination group, and 4 eyes (14.3%) in the monotherapy group ($p = 0.025$). The number of required reinjection was lower in the combination group (3.8 vs. 6.6, $p = 0.041$). The rate of GA development did not differ in the two groups (65.0% vs. 67.9%, $p = 1.000$). After 3 years follow-up, log MAR BCVA decreased to baseline level in both groups.

Conclusions: Combination therapy leads to significantly lower recurrence and retreatment than anti-VEGF monotherapy. Even in the early stage of RAP, long-term visual prognosis were impaired in both groups owing to the development of GA.

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Keywords: Retinal Angiomatous Proliferation, Photodynamic Therapy, Anti-VEGF.

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A Biomarker of Age-Related Macular Degeneration: Neutrophil/Lymphocyte Ratio

Alper Sengul¹, Ozgur Artunay², Erdal Yuzbasioglu¹

¹Istanbul Bilim University Ophthalmology Department, Istanbul, Turkey; ²Istanbul Medicine Hospital Ophthalmology Department, Istanbul, Turkey

Introduction: The neutrophil/lymphocyte ratio (NLR) is an indicator of systemic inflammation. Elevated NLR has been related to some chronic diseases with inflammatory features. In this study we investigate NLR levels in age-related macular degeneration (AMD) patients as an inflammation indicator.

Methods or Study Design: One hundred patients with AMD and 100 healthy age- and sex-matched controls were studied. Blood samples were collected by venipuncture for routine analysis. Blood samples were collected in dipotassium ethylenediaminetetraacetic acid (EDTA) tubes and biochemistry tubes. Neutrophil and leukocyte counts were measured using an automatic blood counter. The NLR of the patients was obtained from the hospital laboratory archive and was measured by dividing the neutrophil count by the lymphocyte count.

Results: A significant difference was found in NLR values between AMD group and control group ($p < 0.05$). In correlation analyses, NLR was correlated positively with age ($p < 0.05$) and disease severity ($p < 0.05$).

Conclusions: In AMD patients NLR levels are higher than controls and NLR levels correlates with disease severity. NLR can be used as a biomarker of severity of AMD and inflammation.

Acknowledgements: The authors declare that they have no financial interest.

Keywords: Age-Related Macular Degeneration, Inflammation, Neutrophil/Lymphocyte Ratio.

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Anti VEGF Agent Failure – Switching Strategies

Joseph Pikkel¹, Shira Attas²

¹Ziv Medical Center, Zafet, Israel; ²Novartis Pharma, Petach Tikva, Israel

Introduction: Anti VEGF intra-vitreous injections are recommended treatment in neovascular Age Related Macular Degeneration (nAMD), a leading cause of irreversible vision loss.

Ranibizumab has been established as an effective treatment for nAMD in large-scale, prospective, randomized, controlled multicenter studies. However, bevacizumab is extensively used off-label for this indication. In several countries, bevacizumab is the initial anti VEGF used due to economic considerations. Though this may result in halting the active stage of the disease, reducing central macular thickness (CMT) and improving visual acuity (VA), bevacizumab treatment may fail to do so. In such cases of treatment failure, ophthalmologists face a dilemma of which anti VEGF agent to inject next.

Purpose: The purpose of our work was to collate information from studies published to date focusing on switching in Anti

VEGF therapy, and describes the currently available data in anti VEGF switching in nAMD.

Methods or Study Design: A PubMed search of published articles from Jan 2013 to the submission date was conducted. Published studies were compared in parameters of sample size, reason for switch, duration of follow up and switch outcome (VA and CMT).

Results: Our search revealed 31 relevant publications. Switching from bevacizumab to ranibizumab mostly showed improvement in VA and CMT (5/6 and 4/6 studies, respectively) whereas switching from ranibizumab to bevacizumab was less effective (no VA or CMT improvement in 2/4 studies). Switching from either agent to aflibercept resulted mostly in improvement of CMT (16/21 studies) but rarely in VA improvement (3/21 studies). Not all results were statistically significant, likely due to small sample size.

Conclusions: These results suggest that ranibizumab has a favorable efficacy and safety profile for patients with initial poor response to bevacizumab.

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Anatomical Analysis with Spectral Domain Optical Coherence Tomography in Naïve Exudative Age-Related Macular Degeneration (AMD) after Aflibercept Loading-Dose

Verónica Castro-Navarro¹, Enrique Cervera-Taulet², Javier Montero-Hernández², Francisco Javier Romero-Gómez³

¹Hospital General Universitario de Valencia, Escuela de Doctorado, Universidad Católica de Valencia San Vicente Mártir, Valencia, Valencia, Spain; ²Hospital General Universitario de Valencia, Valencia, Valencia, Spain; ³Escuela de Doctorado, Universidad Católica de Valencia San Vicente Mártir, Valencia, Valencia, Spain

Introduction: The purpose of this study is to analyze visual acuity (BCVA), morphological and microstructural foveal alterations in naïve exudative age-related macular degeneration (AMD) treated with aflibercept.

Methods or Study Design: Retrospective study of patients with untreated exudative-AMD evaluated at baseline and after three loading-dose-monthly aflibercept injections. Patients underwent LogMAR-BCVA (ETDRS) and Spectral-domain-optical-coherence-tomography (SD-OCT) 9x9 mm cube-scans (3D-OCT2000, TopCon) of the macular area. Central macular thickness (CMT) and macular volume (MV) were automatically generated. A retinologist manually measured the length of ellipsoid zone (EZ) and external limiting membrane (ELM) within 1 mm nasal and temporal from the fovea and choroidal thickness (subfoveal, 500 μ nasal and 500 μ temporal). The presence/absence of subretinal fluid (SRF), intraretinal fluid (IRF) or pigment epithelium detachment (PED) was documented. If present, PED was divided into serous-vascularizedPEDs or fibrovascularPEDs. A Wilcoxon-test or Spearman's rank correlation coefficient were used with statistical significance defined as $p < 0.05$.

Results: Thirty eyes were analyzed. After treatment, BCVA improved from 0.62 ± 0.26 to 0.44 ± 0.32 ($p = 0.003$) and CMT de-

creased from $345.2 \pm 90.45 \mu$ to $260 \pm 93.47 \mu$ ($p = 0.000$). Similarly, MV decrease from $8.20 \pm 1.1 \text{ mm}^3$ to $7.18 \pm 1.45 \text{ mm}^3$ ($p = 0.000$). At baseline, ELM and EZ length were $1697.25 \pm 211.50 \mu$ and $1699.56 \pm 217.10 \mu$, respectively; changing to $1709.90 \pm 190.3 \mu$ ($p = 0.439$) and $1627 \pm 166.93 \mu$ ($p = 0.198$) at last review. A decrease in choroidal thickness was observed, decreasing from an initial $231.76 \pm 29.47 \mu$ subfoveal, $229.66 \pm 30.53 \mu$ nasal and $318.5 \pm 364.84 \mu$ temporal to a final $206.83 \pm 35.56 \mu$ subfoveal, $203.66 \pm 24.11 \mu$ nasal and $225.13 \pm 37.05 \mu$ temporal ($p = 0.023$; $p = 0.001$; $p = 0.003$).

At baseline, SRF and IRF was observed in 86.7% ($n = 26$) and 56.7% ($n = 17$) of patients. At 12 weeks, percentages decreased to 6.7% ($n = 2$) and 10% ($n = 3$), respectively.

Of all eyes, 23.3% ($n = 7$) presented with fibrovascularPEDs and 46.7% ($n = 14$) with serous-vascularizedPEDs. At last review, 50% ($n = 15$) were fibrovascularPEDs and 10% ($n = 3$) serous-vascularizedPEDs. At baseline, PED heights were $146.53 \pm 144.66 \mu$ at maximum height, $89.5 \pm 121.4 \mu$ subfoveal, $78.53 \pm 107.49 \mu$ nasal and $87.1 \pm 128.66 \mu$ temporal. Postoperative-PED measures were $64.66 \pm 69.23 \mu$ at maximum height, $34.16 \pm 44.01 \mu$ subfoveal, $25.46 \pm 50.75 \mu$ nasal and $34.93 \pm 53.94 \mu$ temporal ($p = 0.001$; $p = 0.025$; $p = 0.002$; $p = 0.005$).

Conclusions: Aflibercept loading-regime seems to be effective in naïve-AMD improving morphologic alterations and visual outcome.

Acknowledgements: No financial disclosure.

Keywords: Age-Related Macular Degeneration, Aflibercept, External Limiting Membrane, Ellipsoid Zone.

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Some Pathological Aspects of Interaction of Age-Related Macular Degeneration and Cytomegalovirus Infection

Simona Valentinovna Simonova

Ophthalmological Clinical Hospital, Moscow, Russia

Introduction: One of the first microorganism in the chronic vascular pathology was cytomegalovirus. Among adult population in the Russian Federation a part of seropositive is 73–98%. The role of CMV as a inflammation trigger with the following development of vascular pathology (atherosclerosis, vasculitis) was confirmed by many Russian and foreign researches. A number of scientists suggested possible role of CMV in the development of age-related macular degeneration (AMD) and progression from dry to the wet AMD, having found out decreased level of IgG in plasma among patients with CMV.

Methods or Study Design: Different scientists have attempted to find the connection between chronic CMV infection and the growth of choroidal neo-vascular vessels in experimental research on mice.

Results: There are 3 main theories.

Firstly, long-time persistence viruses in macrophages with latent CMV infection. As a result anti – macrophage therapy leads to decreased size and activity of CNV membrane.

Secondly, persistent infection of endothelial cells can lead to macrophage attraction, their adhesion and synthesis of pro-in-

flammatory cytokines in lesion and can results in neo vascular activation.

Thirdly, CNV effect on age-related macular degeneration can be conducted with non – specific immune stimulation.

Acknowledgements: Thus, the development of AMD in any object is determined by age changes of vascular system and pigment epithelium cells, genetic predisposition, the way of life, meal and metabolism peculiarities, immune reaction and so on, which is a multifactorial process.

Conclusions: CMV infection may be considered as a trigger of inflammation and progression of age-related macular degeneration.

Keywords: Age-Related Macular Degeneration, Cytomegalovirus Infection.

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Baseline Characteristics of Over 22,000 Patients with Neovascular Age-Related Macular Degeneration: Latest Results from the Real-World LUMINOUS Study

Marta S. Figueroa

Department of Ophthalmology, Hospital Universitario Ramón y Cajal, Madrid, Spain

Introduction: LUMINOUS™ is the largest prospective observational trial in medical retina, designed to evaluate the long-term safety, effectiveness, treatment patterns and health-related quality-of-life associated with ranibizumab treatment in clinical practice for all licensed indications from over 30,000 patients across 43 countries. Preliminary results from the cohort of 22,089 neovascular age-related macular degeneration (nAMD) patients in the third interim analysis i.e. those recruited prior to March 2015 are described.

Methods or Study Design: Treatment-naïve (T1), prior ranibizumab treated (T2) or other prior ocular treated (T3) patients were enrolled for indications as per the local label.

Results: A total of 29,055 patients were recruited prior to March 2015, of whom, 22,089 had nAMD; 5,995 in T1, 15,623 in T2, and 471 in T3. Mean age was 77.3 (23.3% >=85 yrs), 75.6% were Caucasian and 57.6% were female. Overall, the percentage of nAMD patients with predominantly classic lesions was 33.5% (43.8%, 29.3% and 42.5% for T1, T2 and T3, respectively). Mean baseline visual acuity (VA, ETDRS letters) was higher in T2 (56.3) than T1 (49.3) and T3 (49.3). Median time from diagnosis of nAMD to first treatment was 5.1 days for T1. Time from diagnosis to study entry was 80.1 weeks and 19.2 weeks for T2 and T3 groups, respectively. Overall, 42.3% of the nAMD population had pigment epithelium detachment, 7.5% had polypoidal choroidal vasculopathy and 3.8% had retinal angiomatous proliferation.

Baseline comorbidities included myocardial infarction (7.1%), stroke (5.5%), other thromboembolic events (4.9%), family history of coronary artery disease (14.1%), diabetes (28.0%), hypertension (58.5%), and obesity (BMI >30 kg/m²; 12.1%).

Conclusions:

- LUMINOUS includes patients with wide-ranging baseline characteristics from a large number of geographies representative of the real-world.

- Future 1, 2 and 3 year follow-up data from LUMINOUS across diverse geographies will provide an invaluable source of long-term real-world data regarding ranibizumab in clinical practice.

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Keywords: LUMINOUS, Ranibizumab, Neovascular Age-Related Macular Degeneration, Real-World, Baseline Characteristics.

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Ranibizumab Treatment in Exudative AMD

Rabiatül BÜSRA Akdan BİLEN, İrfan Ergen, Onur Catak, Ulkü Celiker

Department of Ophthalmology, Firat University School of Medicine, Elazığ, Turkey

Introduction: The purpose of this study was to evaluate the effect of ranibizumab on exudative AMD after the first and the second years.

Methods or Study Design: 63 eyes of 49 patients were evaluated retrospectively. After three initial monthly doses, ranibizumab was administered as PRN during the first and the second years. The mean central foveal thickness (CFT) and best corrected visual acuity (BCVA) were compared with the baseline after 12 and 24 months respectively.

Results: The mean BCVA and CFT were 20/160 ± 20/100 and 416 µm ± 274 µm respectively, during baseline and they were 20/125 ± 20/100 and 311 µm ± 139 µm respectively after 12 months. The mean BCVA didn't change after 12 months vs the baseline. However, the mean CFT significantly decreased after 12 months (p = 0.003). The mean BCVA and the mean CFT of 31 eyes of 25 patients who continued to attend their control visits in the second year were 20/125 ± 20/100 and 415.20 µm ± 219.7 µm respectively, during baseline and they were 20/100 ± 20/200 and 266 µm ± 101 µm respectively after 24 months. Although the mean BCVA of the 31 eyes didn't change vs the baseline of these patients, the mean CFT significantly decreased at the end of the second year (p = 0.0006).

Conclusions: This study shows that ranibizumab is effective on stabilization of visual acuity and on decreasing macular edema in exudative AMD during the first and the second year of the treatment.

Acknowledgements: Patients who were treated between January 2011 and March 2013 at Firat university department of ophthalmology were evaluated.

Keywords: Ranibizumab, Exudative, AMD.

The Morbidity of AMD and the Impact of Anti-VEGF Drugs on the Reduction of Blindness of the AMD Neovascular Form

Anna Nikolaevna Vasilkina¹, Olga Vladimirovna Vasilkina²

¹The Mordovian State University, Saransk City, Russia;

²The Russian Medical Academy of Postgraduation Education, Moscow City, Russia

Introduction: AMD is one of the main reasons of blindness and vision acuity reduction in developed countries. Considering a persistent tendency of senile and old-age population increase in the whole world, the upcoming decades are expected to show a significant growth of AMD occurrence, which is substantiated by AMD inclusion in the list of diseases covered by WHO's VISION 2020 program.

Methods or Study Design: The statistical analysis method provided analysis of the following data in Republic of Mordovia: aged population; occurrence of AMD among aged population; patients receiving anti-VEGF therapy for this disease; results of anti-VEGF therapy have been retrospectively analyzed in terms of their impact on the clinical picture of the AMD neovascular form.

Results: There are 808,900 persons residing in the Republic of Mordovia. The number of elderly population is 205,747 persons. According to the data for 2013, 2014, 2015, the occurrence of AMD neovascular form among elderly population in 2013 was 210 cases, in 2014 – 250 cases, in 2015 – 158 cases. 185 patients were diagnosed with choroidal neovascularization. 110 pts were given Ranibizumab in 2013, 185 in 2014 and 104 in 2015. At the premises of the State-financed Health Institution of the Republic of Mordovia, Ranibizumab has been given since 2013 to the present time 100% free of charge. As a result of the monotherapy, 5% of patients had no positive dynamics; increase of visual acuity for less than 5 letters was found in 20%, for 5–10 letters – in 35%, for 15 letters and more – in 40%. In 15% of cases, patients had no complaints on distortion of items after the therapy undertaken.

Conclusions: Ranibizumab monotherapy in patients with neovascular form of AMD degeneration is an effective treatment method. Improvement of vision acuteness have been reported, with no complaints to distortion of items. However, we believe that better vision improvement is possible as compared to the results obtained, as initially patients received treatment too late, without any high potential to vision improvement upon this nosology.

Acknowledgements: Thanks to the main ophthalmologist of the Mordovian Republic Olga Victorovna Antipova for the provided data.

Complex Analysis of Cytokines Genes Polymorphisms in Patients with Age-Related Macular Degeneration

Valeriy V. Chernykh¹, Vladimir I. Konenkov², Alena V. Eremina¹, Alexander N. Trunov¹, Viktor F. Prokofiev², Alla V. Shevchenko²

¹The Academician S.N. Fyodorov Federal State Institution

«Intersectoral Research and Technology Complex «Eye microsurgery» Ministry of Health of Russian Federation», Novosibirsk branch, Novosibirsk, Russia; ²Federal State Budgetary Scientific Institution «Scientific Institute of clinical and experimental lymphology», Novosibirsk, Russia

Introduction: Specific molecular-genetic mechanisms that promote the development of pathological changes in age-related macular degeneration (AMD) are still disputable.

Purpose: To study polymorphisms in promotor regions of cytokines: TNF-A863C, TNF-A308G, TNF-A238G, IL1 β -C-31T, IL4-C590T, IL6-C174G, IL10A-1082G, and IL10-A592C in patients with AMD to find disease-associated complex genotypes.

Methods or Study Design: 202 patients were included to the study. The study group consisted of 102 patients with AMD: mean age $\pm$ SD – 64.19 $\pm$ 1.03; males – 21.2%, females – 78.8%. The control group consisted of 100 patients without signs of AMD: mean age $\pm$ SD – 59.92 $\pm$ 0.77; males – 10.2%, females – 89.8%. All patients were Caucasoids; all of the patients and their parents were inhabitants of Russia, Siberia. Genes polymorphisms detection was conducted in blood samples using restriction fragment length polymorphism analysis.

Results: We detected 48 complex genotypes positively associated with AMD and 32 complex genotypes negatively associated with AMD. The incidence of two polymorphisms was statistically significantly different between control and study groups – TNF-308 GA (OR = 2.91 95% CI 1.39–6.11) and IL10-1082 GG (OR = 2.21 95% CI 1.08–4.52). Genotype TNF-308 AA was found to be protective (OR = 0.22 95% CI 0.06–0.81).

Conclusions: TNF-308 GA and IL10-1082 GG could be considered as risk factors of AMD. Complex analysis of cytokines genes could be important in the study of risk factors and pathogenesis of AMD.

Acknowledgements: No.

Keywords: Cytokines Genes Polymorphisms, Age-Related Macular Degeneration.

Thermal Laser, in the Management of Extra-Foveal, Idiopathic Polypoidal Choroidal Vasculopathy

Hemalatha Kolli, Samer Elsherbiny

Birmingham and Midland Eye Centre, Birmingham, United Kingdom

Introduction: To assess the role of thermal laser as an adjunctive treatment for idiopathic polypoidal choroidal vasculopathy (IPCV).

Methods or Study Design: A retrospective study of case notes of 12 patients diagnosed with IPCV was conducted. Thirteen eyes of 12 patients were identified over an 18 year period. Male: female ratio was 3:9. Age range was 73–95 yrs. Two out of the 13 eyes had been treated with anti-VEGF injections elsewhere as wet ARMD; the remainder had received no previous treatment. All patients were assessed with OCT, FFA and ICGA. All eyes had extra-foveal IPCV and received focal thermal laser. Two patients required anti-VEGF injections and 2 patients required photodynamic therapy in addition.

Results: Two patients required anti-VEGF injections and 2 patients required photo dynamic therapy. At final visit, 13 eyes had a dry macula, with 2 eyes losing less than 3 lines of vision and 3 eyes losing more than 3 lines of vision, 5 eyes maintaining vision and 3 eyes improving by at least 1 line of vision.

Conclusions: This small retrospective study provides some evidence that targeted focal thermal laser for appropriately diagnosed extra-foveal IPCV could offer a useful primary or adjunctive therapy. A larger prospective trial is required to study this treatment effect further.

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Optical Coherence Tomography Angiography Findings in Classic and Occult Types of Choroidal Neovascularization

Irina Panova¹, Timur Shaimov¹, Ruslan Shaimov², Venera Shaimova²

¹South Ural State Medical University, Ophthalmology Department, Chelyabinsk, Russia; ²Zrenie Eye Center LLC, Chelyabinsk, Russia

Introduction: Optical coherence tomography angiography (angio-OCT, OCT angiography) is a new non-invasive diagnostic method that can help to visualize the abnormalities of the retinal vessels without injecting of any dye.

Methods or Study Design: We have studied 76 patients (87 eyes), including 68 patients (72 eyes) with neovascular age-related

macular degeneration (AMD) and 8 patients (15 eyes) without neovascularization. All patients have undergone spectral-domain OCT, OCT angiography (RTVue XR Avanti, Optovue) with SSA-DA algorithm, fluorescein angiography. We have analyzed the localization, shape, degree of visualization, the size of the neovascular networks. We have investigated a group of 37 eyes with CNV and a group of 15 eyes with no evidence of neovascularization to determine the sensitivity and specificity of OCT angiography. Fluorescein angiography was used as the basis for diagnosis. We have studied 9 patients (9 eyes) to evaluate the angio-OCT information value during intravitreal ranibizumab therapy one day before injection, at 3rd, 10th, 17th, 24th and 31st days after the treatment.

Results: Patients were divided into two groups: Group 1 (43 eyes) with an occult CNV, Group 2 (29 eyes) with classic CNV. In most cases a loop-like form of a neovascular network under the RPE was often visualized (76.74%) in patients with an occult CNV, classic CNV neovascular network had a clear margin, with a tree-like and loop-like shape with the same frequency (51.72% and 42.28%, respectively). The results of OCT angiography in patients before and after intravitreal ranibizumab has revealed a decrease in neovascular complex area, density, thickness and shape of the newly formed vessels. OCT angiography sensitivity was 89.2%, specificity – 93.3%.

Conclusions: The use of optical coherence tomography angiography allows to diagnose classic and occult types of choroidal neovascularization in AMD and to assess the dynamics of the neovascular complex during anti-VEGF therapy. OCT angiography has a high sensitivity and specificity.

Acknowledgements: The authors gratefully acknowledge the staff of the SUSMU Ophthalmology Department and Zrenie Eye Center LLC, Chelyabinsk, Russia for the excellent organization of the ophthalmologic care in Chelyabinsk.

Keywords: OCT Angiography, CNV, Angio-OCT, Optical Coherence Tomography Angiography.

Changing of the Subfoveal Choroidal Thickness in Patients with Polypoidal Choroidal Vasculopathy (PCV) after Ranibizumab Therapy

Elmira Abdulaevna Abdulaeva¹, Aydar Nailevich Amirov¹, Irina Evgenievna Panova²

¹Kazan State Medical Academy, Department of Ophthalmology, Kazan, Russia; ²South Ural State Medical University, Department of Ophthalmology, Chelyabinsk, Russia

Introduction: To determine change in the subfoveal choroidal thickness in patients with polypoidal choroidal vasculopathy (PCV) after ranibizumab therapy.

Methods or Study Design: We studied 32 eyes (32 patients, 21 men and 11 women 52–78 years old, mean age was 67 years) with typical polypoidal choroidal vasculopathy before treatment and after 3 monthly intravitreal ranibizumab 0.5 mg. All enrolled patients undertook clinical ophthalmic examination, including best visual acuity measurement, ocular tonometry, biomicroscopy, and indirect ophthalmoscopy.

Polypoidallesions and branching vascular network were diagnosed by ICGA. Monthly subfoveal choroidal thickness was studied by optical coherence tomography (OCT) with enhanced-dephtimaging (EDI) by Spectralis OCT + HRA Heidelberg Engineering, Germany.

Subfoveal choroidal thickness was manual measured by means of the program Heidelberg Eye Explorer (V.1.9.10.0).

Results: The average subfoveal choroidal thickness reduced 1 month later on 3 monthly ranibizumab injections ($p = 0.001$) and became ($203 \pm 96 \mu\text{m}$) from baseline ($269 \pm 102 \mu\text{m}$). The best-corrected visual acuity (BCVA) 1 month later on 3 monthly ranibizumab injections improved in 31.25% and was sustained in 56.25%. ICGA demonstrated reducing of PCV activity.

Conclusions: Ranibizumab therapy provided decreasing of subfoveal choroidal thickness, regressing of polypoidal lesions, what could mean reducing of PCV activity.

Measuring of subfoveal choroidal thickness can be important for prognosis and can be included in monitoring of patients with PCV.

Acknowledgements: I express my gratitude in the face of scientific advisers I. Panova and A. Amirov.

Keywords: Polypoidal Choroidal Vasculopathy, Ranibizumab, OCT EDI.

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Retinal Angiomatous Proliferation and Polypoidal Choroidal Vasculopathy in the Same Eye of a Patient with Exudative Age-Related Macular Degeneration

Isil Sayman Muslubas, Serra Arf, Mumin Hocaoglu, Murat Karacorlu
Istanbul Retina Institute, Istanbul, Turkey

Introduction: Neovascular AMD is characterized by classic and occult choroidal neovascularization. Recently, ICGA has provided more information about the choroidal circulation and new findings of retinal angiomatous proliferation (RAP) and polypoidal choroidal vasculopathy (PCV) have emerged.

Methods or Study Design: Case Report.

Results: A 83-year-old woman was examined with a 1-month history of decreased vision in the LE. Her BCVA was 0.3 OD and 0.2–0.3 OS. Fundus examination revealed glaucomatous optic nerve excavation and retinal pigment epithelial changes in both eyes, and elevation of macular area with retinal hemorrhage at the superior margin of the optic disk in the LE.

IR images showed reticular changes in the macula of both eyes, and FAF showed hyperautofluorescent cystoid lesions in the fovea of the LE, hemorrhage around the optic disk was hypoautofluorescent.

SD-OCT at the fovea showed a shallow pigment epithelial detachment (PED) in the RE consistent with confluent drusen, and vascularized PED, intraretinal fluid and a small intraretinal hyperreflectance with shadowing effect in the LE. Polypoidal lesions at the superior margin of the optic disk were identified in the LE. Choroid was thin in EDI-OCT in both eyes.

FA showed late and faint hyperfluorescent drusen in both eyes. Fluorescein dye pooled in cystoid spaces in the fovea of the LE, and

hemorrhage at the superior margin of the optic disk was hypofluorescent, with some leakage. ICGA revealed hypofluorescent sot drusen and subretinal drusenoid deposits in the RE, there was also a polypoidal lesion nasal to the optic disk. In the LE an abnormal choroidal vascular network around the optic disk and polypoidal lesions were identified, with a small bright hyperfluorescent angiomatous lesion at the fovea.

She was diagnosed with PCV in both eyes and RAP in the LE.

Conclusions: In conclusion, PCV and RAP may appear in the same eye suggesting that those different neovascular lesions occasionally overlap.

Acknowledgements: The authors have no conflict of interest.

Keywords: Retinal Angiomatous Proliferation, Polypoidal Choroidal Vasculopathy, Exudative Age-Related Macular Degeneration.

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The Parameters of the Complex Retina-Choroid in Patients with Combined Pathology: Age-Related Macular Degeneration and Glaucoma by Optical Coherence Tomography

Irina Panova¹, Tatiana Shaimova², Timur Shaimov¹, Alexey Galin²

¹South Ural State Medical University, Chelyabinsk, Russia;

²Zrenie Eye Center LLC, Chelyabinsk, Russia

Introduction: Age-related macular degeneration (AMD) and primary open angle glaucoma (POAG) are one of the main reasons for the decline of visual function and quality of life in geriatric patients. Optical coherence tomography allows us to investigate some aspects of the pathogenesis of AMD and glaucoma.

Methods or Study Design: We identified three study groups (SG): SG1 – AMD with POAG (20 eyes); SG2 – AMD without neuroopticopathy (20 eyes) and control group – patients without disease macular area and optic nerve (14 eyes). Manually measure of the neuro-sensory retina (NSR) thickness, the ganglion cells complex (GCC) thickness and the thickness of the choroid by optical coherence tomography (Avanti RTVue XR) were performed in two areas: area I – 4 mm lateral to the optic nerve head; area II – 4 mm medial to the optic nerve head. Index of thickness of the GCC=GCC thickness/NSR thickness was calculated.

Results: The thickness of the GCC in patients with combined pathology (SG1) was significantly lower than in patients with AMD (SG2) in the areas I and II; index of thickness of the GCC was significantly reduced in SG1 in areas I and II. The thickness of the choroid in areas I and II was significantly reduced in SG1 and reduced in SG2, while in patients with combined pathology the thickness of the choroid was significantly lower than in SG2.

Conclusions: The thickness of the choroid in patients with combined pathology – AMD and POAG was significantly lower than in patients with AMD without neuroopticopathy, which can lead to increased severity of AMD in patients with POAG, because of disorders of retinal trophicity.

Acknowledgements: The authors gratefully acknowledge the staff of the SUSMU Ophthalmology Department and Zrenie Eye

Center LLC, Chelyabinsk, Russia for the excellent organization of the ophthalmologic care.

Keywords: Age-Related Macular Degeneration, Glaucoma, Choroidal Thickness, Retinal Ganglion Cells.

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VEGF Effect on the Type of Age-Related Macular Degeneration in Alzheimer's Disease

Umur A. Kayabasi

World Eye Hospital, Istanbul, Turkey

Introduction: The aim was to explain the importance of the type of age related macular degeneration (AMD) detected in patients with Alzheimer's Disease (AD). Vascular endothelial growth factor (VEGF) levels are known to decrease in AD which may affect the configuration of the retina.

Methods or Study Design: Retinal images of 50 patients (age range 65–84) with PET proven AD were observed retrogradely.

Macular region and changes in the retinal pigment epithelium (RPE) were inspected in detail with optical coherence tomography (OCT).

The ratio of dry AMD to wet AMD was compared with a large Australian epidemiological study.

Results: In 48 patients early dry AMD was detected and in 2 patients neovascularization with edema due to wet type AMD was observed. The ratio of early dry AMD to wet AMD was 48/2:24 in our group. A large Australian epidemiological study revealed the ratio of early dry AMD to neovascular wet AMD as 13.65%/1.38%: 9.8.

Conclusions: We believe that decreased VEGF levels in AD protect against neovascularization in the retina.

Acknowledgements: Not applicable.

Keywords: VEGF; AMD; OCT; Alzheimer's.

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Why Ranibizumab Pre-Filled Syringe Is Preferable to Vial: The Real Life PFS Satisfaction Questionnaire in Italy

Maria Vadalà

Dipartimento BioNeC, Università di Palermo, Palermo, Italy

Introduction: The ranibizumab pre-filled syringe (PFS) was specifically designed for single-use intraocular injection and approved in the European Union in October 2013. This survey compared preference, ease of use, acceptability and satisfaction of ranibizumab-PFS versus vials in real practice.

Methods or Study Design: The ranibizumab pre-filled syringe (PFS) was specifically designed for single-use intraocular injection and approved in the European Union in October 2013. This survey compared preference, ease of use, acceptability and satisfaction of ranibizumab-PFS versus vials in real practice.

Results: The results of the first survey on Italian experience with ranibizumab-PFS in real practice confirmed that PFS requires fewer preparation steps, avoiding the following procedures before

intravitreal injection: attach filter needle; withdraw ranibizumab from the vial; remove filter needle.

The 96.1% of the physicians agree PFS increases the efficiency of injection preparation; it potentially minimizes the risk of contamination (64.7% 'strongly agree' and 35.3% 'agree') and improves dose accuracy (56.9% 'strongly agree' and 33.3% 'agree'). Considering that for each section the composite score could range from 1 (strongly disagree) to 5 (strongly agree), the results show a very high appreciation of the physicians for the PFS: Design features and characteristics 4.57 ± 0.38 , General improvements 4.58 ± 0.42 , Site general opinion 4.53 ± 0.46 .

Conclusions: The results show that all characteristics of PFS have been judged very positively. Italian physicians agree ranibizumab-PFS can help to optimize the overall efficiency of drug administration in the clinical practice by: offering the potential to improve dose accuracy, potentially minimizing the risk of contamination, providing possible time savings for both physicians and patients, resulting in a better patient management.

Acknowledgements: To all the participants to the Survey.

Keywords: Pre-Filled Syringe, Ranibizumab, Intravitreal Therapy, Italian Survey.

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Clinical Effectiveness of Ranibizumab and Aflibercept for Neovascular AMD: A Retrospective Cohort Study Using Electronic Medical Records from the US

Pravin U. Dugel¹, Raymond Griner², Fran Milnes³, Alberto Ferreira³, Rita Freitas⁴

¹Retinal Consultants of Arizona/USC Eye Institute, Arizona/California, United States; ²IMS Health Inc., Massachusetts, United States; ³Novartis Pharma AG, Basel, Switzerland; ⁴Wellmera AG, Basel, Switzerland

Introduction: This study aimed to assess the real-world effectiveness and treatment patterns of ranibizumab (Lucentis®) and aflibercept (Eylea®) for neovascular age-related macular degeneration (nAMD) in the US.

Methods or Study Design: Data were extracted from 49 medical retina practices across the US, using a standardized electronic medical record (EMR) system. Treatment-naïve patients were included if they had a nAMD diagnosis, a ranibizumab or aflibercept prescription between July 2011 and February 2014, and at least one year of follow-up. Eyes were excluded if they switched or discontinued anti-VEGF during the follow-up period.

The primary endpoint was the mean ($\pm$ standard deviation [SD]) change in best corrected visual acuity (BCVA) from baseline to Month 12 (BCVA letter score), compared between ranibizumab and aflibercept using generalized estimating equations, adjusting for baseline BCVA, age and for clustering at the patient-level. Mean number of injections and monitoring visits during the 12 months of follow-up were also compared. Eye was the unit of analysis.

Results: 2,162 ranibizumab eyes and 2,675 aflibercept eyes were included. Ranibizumab patients were older (%patients >80 years-old: ranibizumab = 69.0%, aflibercept = 62.0%) and mean

($\pm$ SD) baseline BCVA was similar [ranibizumab: 60.1 ($\pm$ 17.8); aflibercept: 60.6 ($\pm$ 17.5)].

Overall, the mean observed change in BCVA at Month 12 was +0.1 ($\pm$ 12.3) for both ranibizumab and aflibercept (adjusted difference = 0.0, p = 0.95), with a similar average number of injections [ranibizumab = 6.7; aflibercept = 6.9]. In patients with <69 letters at baseline, mean change was +1.9 ($\pm$ 14.9) for ranibizumab and +2.7 ($\pm$ 14.3) for aflibercept (adjusted difference = -0.7, p = 0.23). In patients with 69–78 letters at baseline, mean change was -1.4 ($\pm$ 7.0) for ranibizumab and -2.6 ($\pm$ 8.8) for aflibercept (adjusted difference = +1.4, p = 0.0009).

Conclusions: These results suggest that ranibizumab and aflibercept have a similar effectiveness and are used in a similar manner in clinical practice, with ranibizumab showing significantly better results in patients with high visual-acuity at baseline. These preliminary findings warrant further investigation in larger patient cohorts with longer follow-up.

Acknowledgements: This study was supported by funding from Novartis Pharma AG, Basel, Switzerland.

Keywords: AMD, Ranibizumab, Aflibercept, Real-World, Effectiveness.

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Clinical Effectiveness of Ranibizumab and Aflibercept for PED: A Retrospective Cohort Study Using Electronic Medical Records from the US

Pravin U. Dugel¹, Raymond Griner², Alberto Ferreira³, Fran Milnes³, Rita Freitas⁴

¹Retinal Consultants of Arizona/USC Eye Institute, Arizona/California, United States; ²IMS Health Inc., Massachusetts, United States; ³Novartis Pharma AG, Basel, Switzerland; ⁴Wellmer AG, Basel, Switzerland

Introduction: Retinal pigment epithelial detachment (PED) is an important predictor of vision loss in patients with neovascular age-related macular degeneration (nAMD). Despite the numerous trials studying the effect of anti-VEGF agents in nAMD, there is limited evidence on its clinical effectiveness in PED patients. This study aimed to assess real-world effectiveness and treatment patterns of PED patients treated with ranibizumab (Lucentis®) and aflibercept (Eylea®) in the US.

Methods or Study Design: Data were extracted from 49 medical retina practices across the US, using a standardized electronic medical record (EMR) system. Treatment-naïve patients were included if they had a diagnosis of nAMD and PED, a ranibizumab or aflibercept prescription between July 2011 and February 2014, and at least one year of follow-up. Eyes were excluded if they switched or discontinued anti-VEGF during the 12 months of follow-up.

The primary endpoint was the mean ($\pm$ standard deviation [SD]) change in best corrected visual acuity (BCVA) from baseline to Month 12 (BCVA letter score), compared between ranibizumab and using generalized estimating equations, adjusting for baseline BCVA, age and for clustering at the patient-level. Mean number of injections and monitoring visits during the 12 months

of follow-up were also compared. Eye was the unit of analysis aflibercept.

Results: 201 ranibizumab eyes and aflibercept 156 eyes were included. Ranibizumab patients were older (%patients >80 years-old: ranibizumab = 74.8%, aflibercept = 53.1%) and mean ($\pm$ SD) baseline BCVA was similar [ranibizumab: 64.0 ($\pm$ 15.6); aflibercept: 62.6 ($\pm$ 18.6)].

Overall, the mean observed change in BCVA at Month 12 was +0.7 ($\pm$ 10.4) with ranibizumab and -0.1 ($\pm$ 12.6) with aflibercept (adjusted difference = +1.6, p = 0.23), with a similar average number of injections [ranibizumab = 7.9; aflibercept = 7.6].

Conclusions: These results suggest that ranibizumab and aflibercept have a similar effectiveness in patients with PED. These preliminary findings warrant further investigation in larger patient cohorts with longer follow-up.

Acknowledgements: This study was supported by funding from Novartis Pharma AG, Basel, Switzerland.

Keywords: PED, Ranibizumab, Aflibercept, Real-World, Effectiveness.

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Efficacy and Safety of Intravitreal Ranibizumab in Patients with Very Advanced Wet AMD in Clinical Practice. The Influence of the Wait Treatment Time

Felix Manco, Belén Haro, Maria Isabel López, Rosalba Ramoa, Sara Sanchez

Hospital Clinico Universitario, Valladolid, Valladolid, Spain

Introduction: Time to treatment is very important in wet AMD because the neovascular complex growths at an average rate of 10–18 per day.

The Purpose of this work is to study the efficacy and safety of intravitreal ranibizumab in patients with very advanced wAMD, severe visual loss and a long waiting time to treatment (WTT).

Methods or Study Design: Cross-sectional, retrospective study of patients with very advanced wAMD and poor visual acuity treated with a intravitreal ranibizumab in a PRN regimen and followed for at least 6 months.

Patients were divided into two groups according to the WTT. Group I: WTT superior to three weeks but under 1 month, Group II: WTT superior to 1 month since diagnosis. Primary outcomes: best corrected visual acuity (BCVA) and central retinal thickness (CRT). Secondary outcomes were the number of intravitreal injections, and local and systemic adverse events (AE).

Results: 59 patients were included. 32 in group I and 27 in group II. Mean WTT was 25 ($\pm$ 3) days in group I and superior to one month in group II (2.29 $\pm$ 0.54 months). Basal BCVA was 0.77 $\pm$ 0.36 LogMAR in group I and 0.88 LogMAR in group II. 21.9% of the patients in group I gained 1 vision-line and only 14.8% in group II. A significant higher number of patients (48%) in group II lost more than 1 vision line (p = 0.08). Mean baseline CRT (296.91 $\pm$ 98.1 μ m) decreased to 245.13 $\pm$ 70 (p = 0.008) in group I and remained stable in group II.

There were no differences in the number of injections (3.15 $\pm$ 0.95 in group I and 3.25 $\pm$ 1.22 in group II). No systemic related

AE were found. Commonest local AE were conjunctival hemorrhage and pain the day of the injection.

Conclusions: A long waiting time to treatment in patients with very advanced wAMD may attenuate the functional and anatomical benefits of intravitreal ranibizumab.

Acknowledgements: This work was partially done with a grant from Novartis.

Keywords: Treatment Time, BCVA, CFT, Adverse Events.

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Short-Term Effects of Intravitreal Ranibizumab on Biomechanical Properties of Eye Fibrous Coat

Alexandra Yulova, Mariya Budzinskaya, Irina Bubnova, Alexey Antonov, Irina Andreeva

State Research Institute of Eye Diseases, Moscow, Russia

Introduction: The purpose of the present research was to determine the short-term effects of single-dose intravitreal ranibizumab injection on biomechanical properties of eye fibrous coat and intraocular pressure (IOP) measurements.

Methods or Study Design: The study included 50 patients (50 eyes) with wet age-related macular degeneration without history of glaucoma or ocular hypertension, corneal pathology and ophthalmic surgery. All patients underwent a standard ophthalmic examination. Corneal hysteresis (CH), corneal resistance factor (CRF), Goldmann-correlated IOP (IOPg) and corneal resistance factor compensated IOP (IOPcc) were examined with an Ocular Response Analyzer (Reichert ORA, USA) directly before the injection, 30 and 180 minutes after the procedure. The axial length of the eyes was measured by A-scan ultrasonography. All patients had 0.05 ml (0.5 mg) of ranibizumab injected into the vitreous.

Results: The eyes were classified into single group according to the axial length from 22.41 mm to 23.54 mm in order to eliminate the possibility of the impact of the size of the eye on IOP level. The mean change in IOP showed significant difference between baseline and first measurements after the injection ($p = 0.012$). Before the injection CH was 10.59 ± 1.44 mm Hg and CRF was 10.90 ± 1.96 mm Hg respectively. We found that there was the increase of CRF (11.40 ± 1.81 mm Hg) and the decrease of CH (9.03 ± 1.06 mm Hg) under the high level of IOP. Difference in CH and CRF was statistically significant ($p < 0.05$).

Conclusions: Intravitreal injection of ranibizumab (0.05 ml) caused a change in biomechanical properties of eye fibrous coat. The changes in biomechanical parameters returned to baseline values with the normalization of IOP values after the first few hours of injection.

Acknowledgements: The authors would like to thank the State Research Institute of Eye Diseases for institutional support.

The authors declare no conflicts of interest in this work.

Keywords: Intravitreal Injection, Intraocular Pressure, Corneal Hysteresis, Corneal Resistance Factor.

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An Empirical Drug-Disease Model to Characterize the Effect of Ranibizumab on Disease Progression in Wet AMD Patients

Cheikh Diack, Dietmar Schwab, Nicolas Frey

F. Roche Pharma Research and Early Development, Clinical Pharmacology, Roche Innovation Center Basel, F. Hoffmann-La Roche Ltd., Switzerland

Introduction: To characterize of the time course of visual acuity with and without anti-VEGF treatment to understand the main drivers of wet AMD disease progression.

Methods or Study Design: A disease model for visual acuity was developed on the 24-month patient level data of 2 phase 3 monthly dosing trials of Ranibizumab (~1100 patients including ~230 untreated patients). Two adaptations of the model in [1] were made: use of a K-PD approach instead of dose to account for dosing frequency and use of an Emax model instead of an exponential for the drug effect.

(1) $VA_t = VA_0 - (VA_0 - V_{Ass}) \cdot (1 - \text{EXP}(-k_{pr} \cdot t)) + \text{Emax} \cdot IR / (E50 + IR)$

(2) $VA_t = VA_0 - (VA_0 - V_{Ass}) \cdot (1 - \text{EXP}(-k_{pr} \cdot (1 - IR / (Ed50 + IR)))) + \text{Emax} \cdot IR / (E50 + IR)$

VA_t , VA_0 and V_{Ass} are respectively the visual acuity at time t , at entry in trial and at steady state when the patient is not under treatment. The quantity IR is proportional to the amount of drug a time t ; k_{pr} represents the rate of progression of the disease.

Baseline covariates were tested on model parameters. The final model was further tested against 2 other phase 3 trials of Ranibizumab with different dosing regimen.

Results: Model (2) was preferred over (1) as it was shown using a deconvolution process, that the model parameter k_{pr} is affected by the treatment in a manner which slows down wet AMD progression suggesting 2 sites of effects for Lucentis. It was shown that some baseline pathologic covariates have an influence on the model parameters VA_0 , K_{pr} and $E50$.

The potency of the symptomatic effect ($E50$) was 5 folds lower than the potency of the protective effect ($Ed50$). The 0.3 mg and 0.5 mg Lucentis are close to the $Emax$ of the symptomatic effect but not so for the protective effect.

Conclusions: The dynamic of visual acuity for wet AMD patients with or without treatment was characterized using a disease model. The influences of several baseline pathologic covariates on model parameters were shown.

Acknowledgements: We thank Vincent Buchheit for his invaluable support in getting access to the data.

Safety and Efficacy of RTH258, A Single-Chain Anti-Vascular Endothelial Growth Factor (VEGF) Antibody Fragment, in Patients with Neovascular Age-Related Macular Degeneration (NAMD): Results from 2 Phase II Studies

Francesco Bandello¹, Andreas Weichselberger²,
Georges Weissgerber², Peter Sallstig²

¹Ospedale San Raffaele, Milano, Italy; ²Alcon, Fort Worth, United States

Introduction: Two Phase II studies in patients with nAMD have been completed assessing safety and efficacy of RTH258, a novel single-chain antibody fragment and anti-VEGF with potential to exhibit better retinal penetration.

Methods or Study Design: C-10-083, a 6-month randomized, double-masked, single-dose ascending, active-controlled, parallel-group study, assessed non-inferiority for the maximum tolerated doses of RTH258 vs ranibizumab in central subfield thickness (CSFT) change from baseline at Month 1 (margin: 40 μ m, α = 0.05).

C-12-006, a 56-week randomized, double-masked, active-controlled study, tested the non-inferiority in BCVA change from baseline at Weeks 12 and 16 (margin: 5 letters, α = 0.1) of RTH258 6.0 mg (q8wks and q12wks) to aflibercept (q8wks).

Results: C-10-083 included 194 patients: RTH258-0.5 mg n = 11, RTH258-3.0 mg n = 31, RTH258-4.5 mg n = 47, RTH258-6.0 mg n = 44 and ranibizumab 0.5 mg n = 61. RTH258 4.5 mg and 6.0 mg were non-inferior to ranibizumab in CSFT mean change from baseline at Month 1 and had longer duration of effect in terms of time to first standard of care treatment.

C-12-006 included 89 patients: RTH258-6.0 mg n = 44 and aflibercept 2.0 mg n = 45. Non-inferiority regarding BCVA was met with mean changes of 5.8 (RTH258) and 6.9 (aflibercept) letters at week 12 (80% CI for treatment difference: [-4.19, 1.93]). At week 16, mean gains of 6.0 (RTH258) and 6.6 (aflibercept) letters were observed (80% CI for treatment difference: [-3.72, 2.56]). Fewer rescue treatments were given to RTH258 treated patients during the Q8 treatment period, with ~50% of RTH258 patients maintaining visual acuity with Q12 dosing. Incidence of systemic adverse events was 68.2% for RTH258 and 80.0% for aflibercept.

Reported adverse events in both trials indicated no safety issues that would preclude further clinical development of RTH258.

Conclusions: Results from both studies support RTH258 as a new treatment option in the management of patients with nAMD. Further studies in larger populations are ongoing.

Acknowledgements: Francesco Bandello Is A Consultant For Alcon, Allergan, Bausch&Lomb, Genentech, Novartis, Sanofi Aventis, Farmila Thea, Bayer, Hofmann La Roche, Alimera Science, Novagali Pharma, Thrombogenics.

Keywords: NAMD, Anti-VEGF Antibody, RTH258, Ranibizumab, Aflibercept.

Morphological and Functional Evaluation after Therapeutical Switch in Non Responsive Wet AMD Patients

Simone Donati, Jennifer Cattaneo, Simona Maria Caprani,
Marco Bianchi, Laura Premoli, Claudio Azzolini

Department of Surgical and Morphological Sciences – Section of Ophthalmology, University of Insubria, Varese, Italy

Introduction: To evaluate morphological and functional retinal modifications after the therapeutical switch to aflibercept in non responders patients.

Methods or Study Design: This prospective study included 24 eyes of 24 consecutive patients affected by CNV secondary to AMD, defined as non responder to ranibizumab treatment. We excluded patients with extensive macular hemorrhages or lesion fibrosis, PED with extended RIP, lesion with fibrovascular scars larger more than 2DA, patients who underwent to more than 12 ranibizumab injections. We considered as non responders the patients in which we didn't show a visual acuity increase or a significative reduction of CNV activity parameters after 5 injections (min 6 months follow-up). Patients were evaluated with complete ophthalmological examination, retinal angiography and SD OCT. A scheduled control visit was performed at month 4 after aflibercept loading phase and at month 8. A statistical analysis has been performed to evaluate the considered variables.

Results: Clinical evaluation showed interesting results. At month 4, mean retinal thickness significantly decreased from $358.54 \pm 32.45 \mu$ m to $287.80 \pm 89.20 \mu$ m; intraretinal and subretinal fluid were significantly reduced respectively in 19 and 16 patients. PED elevation was reduced in 9 of 12 patients. A significant reduction of angiographic activity was perceivable in 19 of 24 lesion studied. Mean visual acuity remained stable from 0.68 ± 0.23 LogMAR to 0.64 ± 0.23 LogMAR; more than 45% patients reported a reduction of metamorphopsia and intensity of the central scotoma. At month 8, patients received a mean of 4.5 aflibercept injections. Mean retinal thickness was $304.80 \pm 45.70 \mu$ m and visual acuity 0.65 ± 0.31 LogMAR.

Conclusions: Therapeutical switch to an alternative antiVEGF agent appeared effective in modifying the natural history of non responders lesions. After the loading phase, morphological features improved and visual acuity showed a different and variable course, depending on photoreceptor layer status before and after the switch.

Acknowledgements: We thanks all our collaborators who work everyday in our clinic in the management, treatment and follow up of AMD patients.

Keywords: Non Responder, Ranibizumab, Aflibercept, OCT, Exudative AMD.

Topical Antibiotic Prophylaxis to Prevent Endophthalmitis after Intravitreal Injection Is Not Necessary

Vladimir Poposki¹, Daniel Vilaplana², Ignasi Jürgens³, Daniela Poposka⁴, Isaac Alarcón², Ana Martínez-Palmer²

¹Institut Catala de Retina, Parc de Salut MAR, Barcelona, Barcelona, Spain; ²Parc de Salut MAR, Barcelona, Barcelona, Spain; ³Institut Catala de Retina, Barcelona, Barcelona, Spain; ⁴Hospital Municipal de Badalona, Barcelona, Barcelona, Spain

Introduction: The endophthalmitis is a devastating complication of intravitreal injections (IVI) procedure. Topical antibiotics are used by consensus and protocol, because of supposed advantage of its use in the reduction of conjunctival bacterial growth. However, this benefit is controversial. Many studies concluded that they do not alter the incidence nor reduce the risk of endophthalmitis. Even more, its repeated use in sub-inhibitory concentrations could start development of resistant and more virulent bacterial strains. Our main objective was to determine the incidence of endophthalmitis following IVI, and its relation to antibiotic prophylaxis.

Methods or Study Design: In a pilot, prospective and randomized study, 522 intravitreal injections were performed at 340 subjects, divided into two groups. Patients who met the established criteria for anti-VEGF treatment, also met our inclusion criteria. The study group included 169 patients without topical antibiotics prophylaxis in the perioperative period, and the control group was composed of 171 patients who instilled antibiotic eye drops. The first group received 264, and the second one 258 IVI. Injections were prepared in a sterile room, immediately before application. All patients underwent 10% povidone-iodine periocular cleaning and 5% povidone-iodine conjunctival hygiene. The injection technique included use of speculum, sterile gloves and mask. After IVI procedure three visits control were made – on days 3, 7 and 30.

Results: Demographic data was homogeneous and comparable. There were no significant differences between mean age and sex. The vast majority were patients with AMD: 70% (study group) and 76% (control group). 26.5% of all studied patients (both groups) had other retinal vascular disease. No patient in either group was suspicious nor had presentation of severe eye infection during the follow-up period.

Conclusions: We do not recommend the routine use of antibiotic prophylaxis with intravitreal injections. The sterile environment and proper aseptic technique are sufficient to prevent endophthalmitis.

Acknowledgements: We would like to thank Sergi Mojal who have helped in carrying out the statistical analysis.

Keywords: Intravitreal Injection Prophylaxis, Topical Antibiotic Prophylaxis, Prevention of Endophthalmitis, Sterile Environment, Proper Aseptic Technique.

Photoreceptor Inner/Outer Segment Junction Status in Dry Age-Related Macular Degeneration Treated by Rheohemapheresis

Hana Langrová¹, Eva Rencová¹, Milan Bláha², Miriam Lánská², Jan Studnicka¹, Vladimír Bláha³, Alexandr Stepanov¹, Jana Breznayová¹

¹Charles University in Prague, Medical faculty in Hradec Králové, Department of Ophthalmology, Hradec Králové, Czech Republic; ²Charles University in Prague, Medical faculty in Hradec Králové, Department of Haematology, Hradec Králové, Czech Republic; ³Charles University in Prague, Medical faculty in Hradec Králové, Department of Metabolic Care and Gerontology, Hradec Králové, Czech Republic

Introduction: To evaluate the long-term effect of rheohaemapheresis (RHF) treatment of age-related macular degeneration (AMD) on the photoreceptor IS/OS junction status.

Methods or Study Design: In our retrospective study we treated 12 patients (22 eyes) and randomised 12 controls (18 eyes) with the dry form of AMD with drusenoid retinal pigment epithelium detachment (DPED). Patients were treated with 8 RHF standardised procedures. We evaluated best corrected visual acuity, IS/OS junction status (HD OCT) and macular function (multifocal electroretinography) at baseline and 2.5-years follow-up.

Results: RHF caused a decrease of whole-blood viscosity about 15% and of plasma viscosity about 12%. BCVA of treated patients increased insignificantly, whereas it decreased significantly in the control group. After 2.5 years, 15 eyes (68.2%) of treated patients remained without IS/OS junction defect, junction defect was found in 7 treated eyes, only 4 of which reached to foveola. We found IS/OS junction defects in 15 control eyes (83%), in 12 eyes the defect reached to foveola. The mfERG responses in the region at eccentricity between 1.8° and 7° were significantly higher in treated patients ($p = 0.04$).

Conclusions: Improvement of rheological parameters after RHF contributed to preservation of photoreceptor IS/OS junction integrity in fovea, which is a predictive factor for preservation of visual acuity.

Acknowledgements: Supported by the grant of the Ministry of Health, CZ, No. NT14037-3/2013.

Keywords: Rheopheresis, Dry AMD, Photoreceptor, IS/OS Junction.

Intravitreal Injection: Antibiotics or Antiseptics

Igor Ioshin, Anna Ivanovna Tolchinskiy, Aina Ozderbaeva

Federal State Institution, Moscow, Russia

Introduction: To compare the use of antibiotics (fluoroquinolones) and antiseptic (miramistin) in the prevention of infections and inflammatory complications after repeated Ranibizumab IVV.

Methods or Study Design: 290 patients with wet AMD in age 69.2 ± 3.5 years were under supervision during the year. Visual

acuity averaged 20/70, retinal thickness in the center was -370 ± 32 microns.

By the method of prevention of infections complications, patients were divided into 2 groups. The first included 154 patients who had a traditional for intraocular surgery scheme: they were administered a fluoroquinolone moxifloxacin for 2 days before surgery. The instillations continued of 60 and 30 minutes before and immediately after the IVT, and then for 7 days after. The second group consisted of 136 patients: they were administered a antiseptic miramistin before 60 and 30 minutes before and immediately after IVT, and then three days after the operation.

Results: Patients were underwent ophthalmologic control in the first, the seventh day, and a month after the introduction of ranibizumab. Efficacy and tolerability of subjective complaints of patients were evaluated in the clinical course.

Throughout the year (mean 3.8 injections) is indicated by a positive result in VA and CRT.

Conclusions: Ranibizumab IVT is invasive treatment that requires effective prevention of complications. When Ranibizumab IVT is traditionally used as an antibiotics for the prevention of infections complications, but many times their application with a short interval between courses can lead to a increase of resistance to pathogens of various infections.

At the heart of the antiseptic active substance is benzyldimethyl surfactant which exhibits a high selectivity for gram-positive and gram-negative bacteria, chlamydia, herpes simplex virus and human immunodeficiency virus, some fungi, without exerting influence on the human cell membranes.

Acknowledgements: Additionally, multiplicity of applications and short term use of antiseptic significantly reduce the cost of treatment.

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Real Life Data in Germany: Adherence to Treatment and Ease of Access to Anti-VEGF Medication Determine Long Term Functional Outcome in Neovascular AMD

Robert G.H. Wilke¹, Helmut G. Sachs²

¹Eye Hospital, Dresden, Germany; ²Krankenhaus Dresden-Friedrichstadt, Dresden, Germany

Introduction: Real life data on nvAMD treatment fall behind published data from large prospective clinical trials. The relatively low number of injections and consequently poorer visual outcome may be attributable to differences in disease stages and to limitations in adherence to treatment. In a setting with full coverage of costs for anti-VEGF treatment in a PRN scheme we have been interested in the effect of adherence to treatment on visual outcome.

Methods or Study Design: In a retrospective study 1506 cases of nvAMD with a follow up periode of up to 5 years have been analyzed. Frequency of visits, number of injections, and functional outcome has been analyzed. Subgroup analyses have been performed to address the question if functional outcome is affected by adherence to treatment and ease of access to treatment.

Results: Overall functional outcome is quite comparable to previously published real-life data from Germany, with number of injections of 5.2 and 3.3, and letter score of +1.7 and -0.8 in year 1 and year 2, respectively. This is well below the number of injections expected to be required. However, subgroup analysis shows a significantly higher injection rate (7.0 and 5.8 injections), leading to significantly better functional outcome (letter score +5.2 and +3.4) in a group of patients that shows high adherence to treatment and has easy access to therapy.

Conclusions: Functional outcomes similar to large prospective trials seem feasible even in a cohort of patients recruited from everyday's practice with no selection according to stage of AMD, atrophy or scarring. Adherence to treatment seems to affect outcome in this setting at least as much. Counseling of patients should consider this finding, patients should be encouraged not to miss or postpone appointments. Clinical routines should be optimized to reduce the frequency and burden of visits, e.g. by a treat&extend scheme and streamlined clinical processes.

Acknowledgements: Study supported with a grant by Novartis Pharma.

Keywords: AMD, CNV, VEGF, AntiVEGF.

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Compliance of Patients Who Had Age-Related Macular Degeneration (AMD) to the Treatment and Follow Up Schedule in Real World

Ozen Ayrançi Osmanbasoglu, Sezin Ozdogan Erkul, Sibel Zirtiloglu, Zeynep Kayaarasi Ozturker, Hulya Gungel, Kadir Eltutar

Istanbul Education and Research Hospital, Istanbul, Turkey

Introduction: The purpose of the study is to assess the compliance of the patients who had age-related macular degeneration (AMD) to the treatment and follow up schedule in real World.

Methods or Study Design: 640 patients' data who admitted to the retina clinic for the first time between 2013 and 2015 were reviewed retrospectively. Age, gender, type of AMD, total follow up period, recommended follow up schedule, compliance to the regular visits and lost to follow up were recorded.

Results: 43.5% of 640 patients lost the follow up after the first examination in the retina clinic. Of those who come to visits, mean age was 72.0 ± 9.1 years (50-89) and mean follow up time was 13.8 ± 8.1 months (3-25). 49.2% were female, 50.8% were male; 56.1% had neovascular AMD. The recommended follow up schedule was ranging from 1 to 6 months according to the disease activity (mean 2.8 ± 1.10), mean number of visits was 5.5 ± 3.7 (1-9). Of those who come to visits, 56.2% lost the follow up after a mean of 3.6 ± 2.2 visits during 8.0 ± 5.9 months follow up. Remaining 43.8% of patients complied the latest controls during 21.3 ± 2.47 months follow up with a mean number of 7.7 ± 3.9 visits. It was observed that only 78% of patients were loyal to the exact recommended follow up schedule and appointments. There were not a significant difference between neovascular and non-neovascular AMD groups regarding the observed parameters.

Conclusions: AMD is the leading cause of blindness in the elderly patients. It was observed in this study that, almost half of the patients lost the follow up after the first visit, while one quarter

after a mean of 8 months. Of those who come to visits only 78% were loyal to the appointment and treatment schedule. In order to avoid blindness, patients compliance should be taken into consideration.

Acknowledgements: None.

Diabetic Retinopathy

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OCEAN: First Data of Patients with Diabetic Macular Edema after Completed Patient Recruitment-Effectiveness of Ranibizumab Therapy after 1 Year

Georg Spital¹, Steffen Schmitz-Valckenberg², Sandra Liakopoulos³, Frank G. Holz², Thomas Bertelmann⁴, Focke Ziemssen⁵

¹Eye Clinic, St. Franziskus Hospital, Münster, Germany;

²University Eye Hospital, Bonn, Germany; ³CIRCL Reading Center, Department of Ophthalmology, University of Cologne, Germany;

⁴University Eye Hospital, Marburg and Novartis Pharma GmbH, Nuremberg, Germany; ⁵University Eye Hospital, Tübingen, Germany

Introduction: The non-interventional OCEAN study is the largest ophthalmic study conducted in Germany to evaluate the real world situation of patients being treated with ranibizumab.

Methods or Study Design: During the observation period of up to 24 months the recorded parameters include: number of visits, visual acuity, central retinal thickness (CRT), fluorescein angiography (FA), and ranibizumab injections. All treatments including diagnoses and monitoring are performed according to routine practice management and the assessment of the investigator. The statistical analysis is purely descriptive.

Results: A total of 1,211 recruited patients with DME were included. Follow-up information after 1 year is available for 587 patients (48%). The mean best corrected visual acuity (BCVA) at baseline was 60.6 ± 15.5 ETDRS letters ($n = 1,203$), increased to 65.5 ± 16.1 ($n = 772$) after 3 months and to 64.3 ± 20.0 ($n = 449$) after 12 months. OCT was performed at baseline in 929 patients (77%). The mean CRT at baseline was 387.9 ± 129.0 μm ($n = 834$), declined to 313.9 ± 106.5 μm ($n = 383$) after 3 months and to 313.8 ± 115.8 μm ($n = 168$) after 12 months. FA was performed at baseline in 843 patients (70%), with vascular leakage in the macula (diabetic macular edema, DME) in 753 patients (89%). At month 3, FA was performed in 98 patients (12%), with detected leakage in 44 patients (45%). At month 12, FA was performed in 22 patients (4%), with detected DME in 13 patients (59%). The mean number of ranibizumab injections per patient within the first year was 4.01 ± 2.16 .

Conclusions: Overall, the effectiveness of ranibizumab in the treatment of DME could be shown with an improved BCVA and

a declined CRT. A decreased neovascular activity was seen, although FA was not often performed. For this ongoing study, further long-term results are expected.

Acknowledgements: None.

Keywords: Diabetic Macular Edema (DME), Non-Interventional Study, Ranibizumab.

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Recovery of Visual Acuity and Foveal Photoreceptor Integrity after Dexamethasone Intravitreal Implant in Eyes with Diabetic Macular Edema

Clara Torralba-Rull, Verónica Castro-Navarro, Catalina Navarro-Palop, Enrique Cervera-Taulet

Hospital General Universitario de Valencia, Valencia, Valencia, Spain

Introduction: The objective of this study is to identify changes in ellipsoid zone (EZ) and external limiting membrane ELM integrity using Spectral-domain optical-coherence-tomography (SD-OCT) findings in patients with diabetic macular edema (DME) treated with one intravitreal dexamethasone injection (DEX) and its association with best corrected visual acuity (BCVA).

Methods or Study Design: Retrospective study. Twenty-one patients underwent one DEX due to DME from January 2014 to January 2015. Measures and SD-OCT were made 15 days before and three months after DEX injection. Central macular thickness (CMT) and macular volume (MV) were automatically generated. A well trained technician manually measured the length corresponding to EZ and ELM layer within 1 mm nasal and temporal from the fovea.

Statistical significance was defined ($p < 0.05$). A one-sample Student's-test for or a Wilcoxon-test were used. Bivariate relationships were examined using Pearson's correlation coefficient/Spearman's rho.

Results: Baseline BCVA was 0.30 ± 0.17 dec. Preoperative analysis revealed a CMT of 540 ± 217.7 μm , a MV of 11.54 ± 2.5 cc, an ELM-length of 1499.57 ± 230.14 and EZ-length of 1542.52 ± 185.89 μm .

Three months after DEX, an improvement in BCVA (0.42 ± 0.24 dec; $p < 0.008$) and a decreased in CMT (350.3 ± 119.6 ; $p < 0.004$) and MV (9.31 ± 1.79 cc; $p = 0.001$) were found. The analysis of the outer retina integrity showed restoration to 1678.1 ± 218.97 μm in the ELM ($p = 0.009$) and to 1711.19 ± 196.68 μm in the EZ layer ($p = 0.001$).

Postoperative-BCVA correlated with preoperative-BCVA, preoperative-ELM and preoperative-EZ integrity ($R = 0.65$, $p = 0.001$; $R = 0.45$, $p < 0.039$; $R = 0.56$, $p = 0.007$). In the same way, final ELM ($R = 0.58$, $p = 0.006$) and EZ ($R = 0.55$; $p = 0.010$) were associated with postoperative-BCVA.

Conclusions: Our results indicated that after one DEX implant there is an improvement in BCVA, a decreased in retinal edema and a restoration in ELM and EZ integrity. As previously report, preoperative-BCVA has a stronger prognostic value for vision; however, ELM and EZ integrity may be useful hallmarks associated with visual outcome.

Acknowledgements: No financial disclosure.

Keywords: Diabetic Retinopathy, Macular Edema, Dexamethasone Intravitreal Implant, External Limiting Membrane, Ellipsoid Zone.

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Effect of Polycythemia Caused by High Altitudes on Macular Edema in Diabetic Patients

Ali Hindi Alghamdi¹, Hamdy Mostafa Kamel²

¹Albaha University, Albaha, Saudi Arabia; ²King Fahd Hospital, Albaha, Saudi Arabia

Introduction: Polychthemia defined as elevated HB above (18.5 g/dl) in male and above (16.5 g/dl) in female, causes slow circulation, hypertension, vascular occlusion and organ edema.

Veinosections in Al_Baha region (located 2400 m ASL) revealed 20% of polycythemia among population.

Methods or Study Design: We studied the effect of polycythemia on diabetic macular edema severity and response to treatment by comparing two groups with and without polycythemia.

Our study included 135 patients: 55 with polycythemia and 80 without, treated by repeated I.V. avastin and/or focal or grid laser.

All patients were followed for at least 6 months and BCVA and CRT were measured at baseline, 1, 3 and 6 months.

Results: In group (1), 80 patients, the mean reduction in CRT was 135.6 and average BCVA improvement was 6 lines.

In group (2), 55 patients, the mean reduction on CRT was only 90.3 and the average BCVA gain was 3.5 disappearance of cme with persistent sub-retinal fluid resistant to treatment after repeated IV avastin and grid laser patient group 2.

Conclusions: Slow circulation (relative stasis) add to bad effect of diabetes on macula.

The severity of diabetic macular edema is more in patients living in high altitudes.

Residual edema for long duration could be seen in such patients despite of all repeated therapeutic modalities.

Acknowledgements: We acknowledge the participation of all KFH team, especially optician team who helped in OCT monitoring of patients of this study.

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Optical Coherence Tomography and Clinical Baseline Characteristics as Predictive Biomarkers of Response to Anti VEGF Treatment in Patients with DME

Maria Isabel Lopez, Clara Vazquez, Roberto Gallego, Rosa Dolz, Lucia Manzanas

Hospital Clinico Universitario, Valladolid, Valladolid, Spain

Introduction: The main goal of ranibizumab treatment in patients with DME is to increase visual acuity, to reduce edema and to prevent severe visual disability but not all patients respond in the

same way, The predictive value of basal visual acuity, long term disease and central thickness have been studied in the context of clinical trials.

The aim of this study is to establish the predicting value of clinical baseline and optical coherence tomography (OCT) characteristics in the response to intravitreal ranibizumab in patients with diabetic macular edema (DME) in clinical practice.

Methods or Study Design: Retrospective, observational, multicenter study in patients with DME and decreased visual acuity. Clinical variables, best corrected visual acuity (BCVA), and qualitative and quantitative SD-OCT data from baseline to 6 months were evaluated in 92 participants (115 eyes) with DME treated with ranibizumab. Safety data were also recorded.

Results: Cystoid edema was the most predominant OCT pattern (50.4%). 64.30% of the eyes had a favorable anatomic response and 58.3% a functional response. Initial macular thickness (CMT), interphase alterations and previous treatments were correlated to anatomic response while initial BCVA, CMT and were the most important predictors for functional response. No positive correlation was found with any systemic variables or the metabolic control.

Conclusions: Ranibizumab response in DME is conditioned by initial BCVA; OCT baseline status, previous treatments and long term disease but not by the level of HbA1c.

Acknowledgements: To the Ophthalmology services of HCUV, IOBA and Hospital La Fe.

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Keywords: Central Foveal Thickness, NSD, BCVA, HbA1c.

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Optical Coherence Tomography Data and Treatment Outcomes in Diffuse Diabetic Macular Edema

Anzhella Fursova, Michail Tarasov, Ida Saifullina, Gusei Salimova

Novosibirsk Region Hospital, Novosibirsk, Russia

Introduction: To study the correlations of the efficacy of intravitreal ranibizumab (IVR) treatment and structural retinal changes detected by optical coherence tomography (OCT) and other factors in patients with diffuse diabetic macular edema (DME).

Methods or Study Design: 100 patients (100 eyes) with diffuse DME were included to the study; mean age $\pm$ SD was 56 ± 1.8 years, 36 males, 64 females. According spectral-domain OCT type of DME the eyes were categorized into four groups (25 patients in each group): sponge-like DME (SDME), cystoid DME (CDME), serous retinal detachment (SRD) and DME with combination of signs of mentioned types – mixed DME (MDME). All of the patients were treated with IVR 0.5 mg; the efficacy was assessed after 3 monthly consecutive injections.

Results: The duration of diabetes varied from 7.52 to 9.84 years and was minimal in patients with SDME (7.52 years) and maximal (9.84 years) – in MDME. Baseline best-corrected visual acuity (BCVA) was significantly ($p < 0.05$) lower in patients with MDME (0.16). Baseline central retinal thickness (CRT) was 402.9 μ m in SDME, 502.9 μ m in CDME, 468.3 μ m in SRD, and 472.3 in MDME.

Maximal injection-free (without recurrence of DME) period after 3 injections was 76 days in SDME and 58–59 days in other types of DME. VA improvement after 3 injections was observed in all patients with minimal BCVA increase (1 line) in patients with MDME ($p < 0.05$ compared to all other DME types). Improvement of BCVA was the most significant (approximately 4 lines) in SDME. Significant ($p < 0.05$) negative correlation was observed between diabetes duration and VA increase. The percentage of CRT reduction was 35.9% in SDME, 41.4% in CDME, 37.7% in SRD, and 34.5% in MDME.

Conclusions: The IVR treatment efficacy correlated with DME OCT-classified type and was minimal in patients with mixed DME. The duration of diabetes influenced VA outcomes as well.

Acknowledgements: anzhellafursova@yandex.ru.

Keywords: IVR, Macular Edema, OCT Pattern.

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OCT Paradigms of the Response to Ranibizumab of Diabetic Macular Edema: Short Term Results

Sergio Piscitello¹, Giulia Torregrossa², Alessandra Casuccio³, Valentina Sunseri Trapani¹, Salvatore Torregrossa², Salvatore Cillino¹, Maria Vadala¹

¹Dipartimento BioNeC, Università di Palermo, Palermo, Italy;

²UOC Oculistica, Ospedali Riuniti Villa Sofia – Cervello, Palermo, Italy; ³Dipartimento Scienze per la Promozione della Salute e Materno-Infantile, Palermo, Italy

Introduction: Diabetic macular edema (DME) correlates from moderate to severe visual loss. Intravitreal therapy with Ranibizumab (IVTR) demonstrates efficacy in limiting visual loss and improving vision in several trials. Looking for clinical predictors of efficacy, researchers' attention is paid to the external retinal layers, as observed by SD-OCT.

Methods or Study Design: Fifty-three eyes of 51 patients affected by DME had been treated by IVTR according to approved label and were prospectively studied with regard to: the quantification of the interruptions of IS/OS layer, the number of hyporeflective intraretinal spots (HIS), the central retinal thickness and volume, the presence or not of a neurosensory foveal detachment (3D SD-OCT 2000, Topcon Co, Japan), one to seven days before the first IVTR, four and six months after therapy. Scan protocols used are '5 lines-cross', focused on IS/OS cumulative integrity, foveal detachment, and HIS, and '3DMacula' focused on macula thickness (micro m) and volume (mm³).

The paired Student's t-test was performed for analysis before and after the treatment. Odds ratios (ORs) were calculated using the linear regression analysis. p values less than 0.05 were considered statistically significant.

Results: Fifty-one patients of whom 36 were naive to anti-VEGF, 25 man and 26 woman, mean age 66.36 ± 9.8 years, mean diabetes duration 18.79 ± 9.2 years, HbA1c mean $7.99\% \pm 1.6$, mean edema duration 21.4 ± 21 months, were followed up for 6 months with a mean of 3.47 ± 0.7 intravitreal injections. Thirty-seven were previously treated by macular laser. All considered parameter showed statistically significant improvement after therapy ($p < 0.001$), but regression and correlation analysis

failed to demonstrate any clear predictive link with visual acuity changes.

Conclusions: Ranibizumab is effective in modifying retinal anatomy and OCT accounted parameters. These latter however, do not directly correlate with short-term VA changes.

Acknowledgements: To Daniela Sabella.

Keywords: Diabetic Macular Edema, Ranibizumab, OCT, External Retina, Predictive Factors.

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The Effect of Panretinal Laser Photocoagulation on Peripapillary Retinal Nerve Fiber Layer Thickness in Patients with Diabetic Retinopathy

Handan Bardak, Yavuz Bardak

Isparta Career Eye Hospital, Isparta, Turkey

Introduction: The aim of the study was to investigate the effect of panretinal argon laser photocoagulation (PRP) on peripapillary retinal nerve fiber layer thickness (RNFLT) in patients with diabetic retinopathy (DR).

Methods or Study Design: Patients having PRP due to DR were included in this retrospective study. Ophthalmologic examinations of patients were performed; corrected visual acuity (CVA) and peripapillary RNFLT of patients were measured. 'Spectral-domain' optical coherence tomography was used to measure the peripapillary RNFLT. At baseline and three, six and twelve months after PRP; the values of RNFLT and CVA were evaluated.

Results: Eighteen eyes of eighteen diabetic patients [(female/male: 10/8, manage 60.22 ± 5.196 years) (mean $\pm$ standard deviation) (min-max: 51–68 years)] were included to this study. At the baseline and three, six and twelve months after PRP; the values of CVA were 0.52 ± 0.22 log MAR, 0.58 ± 0.22 log MAR, 0.43 ± 0.20 log MAR, 0.40 ± 0.21 log MAR respectively, the values of peripapillary RNFLT were 101.27 ± 2.16 μ m, 103.94 ± 2.12 μ m, 98.88 ± 1.84 μ m, 98.16 ± 1.91 μ m respectively. There were not any significant change for the values of CVA at three, six and twelve months after PRP with respect to baseline ($p > 0.05$). There were not any significant change for the values of peripapillary RNFLT at three, six and twelve months after PRP with respect to baseline ($p > 0.05$).

Conclusions: In patients with diabetic retinopathy having PRP, peripapillary RNFLT increase may be related to axonal edema at three months after PRP and peripapillary RNFLT decrease may be related to loss of axonal cells at six and twelve months after PRP. But the changes in peripapillary RNFLT were not significant.

Acknowledgements: There is no financial interest of authors.

Keywords: Diabetic Retinopathy, Optical Coherence Tomography, Panretinal Photocoagulation, Retinal Nerve Fiber Layer.

Our Experience with Dexamethasone Intravitreal Implant (DEX) in Naïve and Refractory to Ranibizumab Diabetic Macular Edema (DME)

Enrique Cervera-Taulet, *Verónica Castro-Navarro*,
Catalina Navarro-Palop, Cecilia Chiarri-Toumit, Clara Torralba-Rull
Hospital General Universitario de Valencia, Valencia, Valencia,
Spain

Introduction: Intravitreal steroids act on diabetic macular edema (DME) through multiple pathways. The purpose of this study is to assess the effect of dexamethasone intravitreal implant (DEX) on refractory to ranibizumab and naïve-DME.

Methods or Study Design: A retrospective observational case series performed in Hospital General de Valencia (HGUUV).

Inclusion criteria were a diagnosis of moderate-severe diabetic retinopathy with fovea-involved DME, confirmed by fluorescein angiogram (FA) and spectral-domain-OCT (SD-OCT). All eyes were treated with dexamethasone intravitreal implant (DEX). Patients were divided into two groups. Group 1 or refractory-DME, those previously treated with at least 3 intravitreal ranibizumab injections (IVR); and Group 2 or steroids-naïve-DME, those with untreated-DME. Clinical examination included best corrected visual acuity (BCVA)-EDTRS and SD-OCT9x9 mm cube-scans (3D-OCT2000, TopCon) of the macular area. Measures were made 15 days before and three months after DEX injection.

Results: Twenty-one eyes of 21 patients ($n = 13$ group 1; $n = 8$ group 2) met the inclusion criteria. Thirteen eyes were enrolled in group 1 (refractory-DME) with an average of prior 3.93 IVR (range 3–8). At baseline, among the patients previously treated with IVR, a 46.2% ($n = 6$) had been previously treated with macular focal laser photocoagulation (MF-LP) associated to panretinal laser photocoagulation (P-LP); and macular ischemia was observed in 7% ($n = 1$). After DEX treatment, BCVA increased from 0.30 ± 0.16 dec to 0.41 ± 0.21 (dec) ($p = 0.017$). A central macular thickness (CMT) and macular volume (MV) improve were found after treatment, decreasing from an initial $615.9 \pm 205.6 \mu$ and 11.98 ± 2.69 cc to $384.92 \pm 131.33 \mu$ and 9.63 ± 2.11 cc, respectively ($p = 0.016$; $p = 0.013$).

Basal characteristics of group 2 or steroid-naïve ($n = 8$) included MF-LP+P-PL in 5 patients, MF-LP isolated in 1 patient and signs of macular ischemia in 1 patient. Similarly, after 1 DEX implant, BCVA improved from 0.30 ± 0.2 dec to 0.44 ± 0.29 dec ($p = 0.176$). Initial CMT decreased from $491.62 \pm 139.94 \mu$ to $294.012 \pm 74.11 \mu$ ($p = 0.012$). Similarly, MV decrease from 10.38 ± 2.11 cc to 8.78 ± 1.01 cc ($p = 0.012$) at last review.

Conclusions: According to our data, 0.7 mg intravitreal Dexamethasone seems to be an effective treatment in refractory-DME and naïve-DME improving in both groups functional and visual outcomes.

Acknowledgements: No financial disclosure.

Keywords: Diabetic Macular Edema, Dexamethasone Intravitreal Implant, Ranibizumab, Diabetic Retinopathy.

Interim Baseline Analysis of Over 4,000 Patients with Diabetic Macular Edema Enrolled in the Real-World LUMINOUS™ Study

Francesco Bandello

Department of Ophthalmology, University Vita-Salute, Scientific Institute San Raffaele, Milan, Italy

Introduction: LUMINOUS™ is the largest prospective observational trial in medical retina, designed to evaluate the long-term safety, effectiveness, treatment patterns and health-related quality-of-life associated with ranibizumab treatment in clinical practice for all licensed indications from over 30,000 patients across 43 countries. Preliminary results from the cohort of 4,427 diabetic macular edema (DME) patients in the third interim analysis i.e. those recruited prior to March 2015 are described.

Methods or Study Design: Treatment-naïve (T1), prior ranibizumab treated (T2) or other prior ocular treated (T3) patients were enrolled for indications as per the local label.

Results: A total of 29,055 patients were recruited prior to March 2015, of whom 4,427 had DME; 1,024 in T1, 2,261 in T2, and 1,142 in T3. Mean age was 64.0, 73.9% were Caucasian and 42.8% were female. Mean baseline visual acuity (VA, ETDRS letters) was higher in T2 (59.1) than T1 (53.1) and T3 (55.6). The majority of T2 (65.1%) and T3 (95.2%) patients had received laser therapy in the past. Median time from diagnosis of DME to first treatment was 3.12 weeks for T1. Time from diagnosis to study entry was 1.47 years and 0.48 years for T2 and T3 groups, respectively. Baseline comorbidities included 7.7% of patients with prior myocardial infarction, 5.7% with prior stroke, 14.3% with family history of coronary artery disease, 66.2% were hypertensive and 23.4% were obese. Overall, DME patients had mean baseline HbA1c levels of 62.7 mmol/mol (7.9%).

Conclusions:

- LUMINOUS includes DME patients across multiple countries with more diverse baseline characteristics than those recruited into randomized controlled trials.
- Prior ranibizumab treated patients had higher VA values at baseline than treatment-naïve patients and those previously treated with other ocular therapies.
- Future follow-up data from DME patients recruited will provide an invaluable source of long-term real-world data for ranibizumab to inform best clinical practice.

Acknowledgements: Authors received writing support for this abstract from Maryanne Donovan (Global Business Services, Novartis Ireland Ltd.).

Keywords: LUMINOUS, Ranibizumab, Diabetic Macular Edema, Real-World, Baseline Characteristics.

Clinical Management of Diabetic Macular Edema by Spanish Retina Specialists in Real-World Practice: OBSERVAR Study

A. Pareja¹, M.J. Abalades², M. Roura³, From The Observar Study Group³

¹Hospital Universitario de Canarias, Tenerife, Santa Cruz de Tenerife, Spain; ²Complejo Hospitalario Universitario de Santiago de Compostela, Universidad de Santiago de Compostela, A Coruña, Spain; Red Temática de Investigación Cooperativa en Salud (RETICS), Instituto de Salud Carlos III, Madrid, Madrid, Spain; ³Novartis Farmacéutica, S.A., Barcelona, Barcelona, Spain

Introduction: Treatments that inhibit vascular endothelial growth factor (VEGF) are widely used to treat retinal vascular disorders, such as diabetic macular edema (DME). We aimed to describe the clinical management of DME by Spanish retinologists in clinical practice.

Methods or Study Design: Observational, retrospective, multicenter study. Forty-two retinologists collected clinical and demographic characteristics from clinical histories of adult DME patients and completed questionnaires about diagnosis, treatments and follow-up patterns.

Results: 256 DME patients 351 eyes [161 (46%) unilateral; 190 (54%) bilateral] with a mean age of 65.2 [standard deviation (SD) 10.4] years were analyzed. Of those, 60.9% were men. Retinologists considered progressive loss of visual acuity (VA) the main symptom suggesting DME (40.9%). Most common diagnostic tests were ETDRS, biomicroscopy, OCT (95.5% each) and fluorescein angiography (68.2%). 59.1% of retinologists based DME first-line treatment on anti-VEGF drugs (100% ranibizumab), and 95.5% opted for laser photocoagulation as concomitant treatment. 52.3% of retinologists used 3 initial anti-VEGF injections, and 47.7% scheduled bi-monthly follow-up visits during the first year post-diagnosis, extended to quarterly visits afterwards (38.6%). The ETDRS during follow-up showed stabilization or even improvement of VA after treatment, improving from 60.4 [SD 17.7] to 65.7 [SD 19.6] mean letters for unilateral and 59.7 [SD 18.8] to 64.8 [SD 15.2] for bilateral DME patients. OCT also revealed a reduction in mean foveal thickness measurement: 409.9 [SD 119.8] μ m to 318.7 [SD 76.8] μ m for unilateral and 416.2 [SD 126.5] μ m to 346.5 [SD 105.0] μ m for bilateral DME patients.

Conclusions: Our data suggest Spanish retinologists use homogeneous criteria regarding diagnosis, treatment and follow-up of DME and that treatments used achieved clinically relevant improvements in visual acuity and reduction in foveal thickness in clinical practice. Treatments include anti-VEGF injections used by the majority of retinologists (59.1%) to treat VA impairment due to DME.

Acknowledgements: The authors thank TFS for the medical writing support.

Study sponsored by Novartis Pharma AG.

Keywords: Diabetic Macular Edema, Ranibizumab, Real World Clinical Practice.

Comparison of Panretinal Photocoagulation for High Risk Proliferative Diabetic Retinopathy Using Single Session of Pattern Scan Laser versus Multiple Sessions of Conventional Laser

Emin Kurt, Göktug Recep Seymenoglu, Hüseyin Mayali

Celal Bayar University, Manisa, Turkey

Introduction: To evaluate the results of panretinal photocoagulation (PRP) via a single session of pattern scan laser (PASCAL) in comparison with multiple sessions of conventional laser in patients with proliferative diabetic retinopathy (PDR).

Methods or Study Design: Charts of 35 eyes which were treated with PASCAL and an equal number of eyes which were treated with conventional laser were retrospectively reviewed. Persistence and/or recurrence of neovascularization, incidence of complications, total number of laser spots, mean power used were compared.

Results: Patients treated with the PASCAL received significantly higher number of laser spots than those treated with conventional laser (2,885 vs 1,642, $p = 0.001$). The PASCAL and conventional laser systems required an average power of 650 vs 330 mw, respectively ($p = 0.001$). Patients treated with the PASCAL showed similar rates of treatment failure within 12 months of follow up compared with patients treated with conventional laser (14% vs 11%, $p > 0.05$).

Conclusions: Our study confirms that single session PRP with the PASCAL is as effective as conventional laser and has an acceptable side-effect profile.

Acknowledgements: I am grateful to my clinic and co-worker.

Keywords: Proliferative Diabetic Retinopathy, Pattern Scan Laser, Panretinal Photocoagulation.

Treatment Modality with Anti-VEGF (Bevacizumab) in Diabetic Maculopathy

Romualdo Malagola, Luigi Pattavina, Raffaele Migliorini, Rossella Giannotti, Loredana Arrico

University Sapienza Department of Ophthalmology, Rome, Italy

Introduction: Assessment of the therapeutic efficiency of Bevacizumab in the treatment of diabetic macular edema. Prospective study with 180-day follow-up.

Methods or Study Design: 30 eyes of 25 patients with diabetic macular edema underwent a cycle of 3 intravitreal injections (each dose: 1.25 mg/0.05 ml of Bevacizumab – Avastin 100), with an interval of a month between each other. The anterior segment and fundus oculi of the patients were controlled the following day. 30 days after each injection and three months after the last injection, visual acuity (BCVA) and central macular thickness using OCT were determined.

Results: The mean value of BCVA at baseline was 0.80 ± 0.46 logMAR. After the first injection, it reached 0.76 ± 0.47 logMAR, with a further increase after the second administration (mean val-

ue 0.66 ± 0.48 logMAR; $p = 0.02$). After the third injection, a small reduction of BCVA (0.69 ± 0.45 logMAR $p = 0.03$) was noted; in spite of this, the value was better than the one at baseline. At the end of the cycle, the final result showed: 15 eyes (50%) with an improvement of visual acuity, 12 eyes (40%) that remained stable and 3 eyes (10%) with a reduction of visual acuity as compared to baseline. The average value of macular thickness at the last control was down about $85 \mu\text{m}$ as compared with the baseline.

Conclusions: Although the therapeutic efficiency of Bevacizumab was evident already after the first injection, a repeated treatment shows add-on effects in time.

Acknowledgements: The Authors have no financial interest in any of the products mentioned in the manuscript.

Keywords: Diabetic Retinopathy, Macular Oedema, Intravitreal Bevacizumab, OCT, Macular Thickness.

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Short Term Results of Sequential Therapy with Dexamethasone Intravitreal Implant and Intravitreal Ranibizumab in Patients with Persistent Diabetic Macular Edema

Recep Göktug Seymenoglu, Saban Kiliç, Emin Kurt

Celal Bayar University Department of Ophthalmology, Manisa, Turkey

Introduction: The purpose of the study was to evaluate the efficacy and safety of combined intravitreal dexamethasone implant (IVDI) and ranibizumab in patients with persistent diabetic macular edema (DME) refractory to various treatments.

Methods or Study Design: Thirty-six eyes of 28 patients were included in this prospective study. Patients included had central macular thickness (CMT) of $\geq 300 \mu\text{m}$ and received at least 3 consecutive monthly intravitreal injections of anti-VEGF and/or focal/grid laser photocoagulation previously. Patients underwent a single injection of IVDI and followed up for 6 months. Patients were allowed for additional treatment with intravitreal ranibizumab who showed a worsening of their functional or structural condition during follow up. Primary outcome measures were the mean changes in best corrected visual acuity (BCVA), CMT and intraocular pressure (IOP).

Results: At baseline; mean BCVA was 0.65 ± 0.3 logMAR, mean CMT was $501.2 \pm 145.9 \mu\text{m}$. Mean BCVA improved to 0.54 ± 0.31 ($p = 0.014$) logMAR and mean CMT decreased to $351.0 \pm 112.3 \mu\text{m}$ ($p = 0$) after the 3rd month. Starting at the end of Month 3, DME recurrence was noted in 26 eyes of 19 patients during the study period and these eyes were given IVRB. Mean BCVA improved to 0.50 ± 0.32 ($p = 0$) logMAR and mean CMT decreased to $360.2 \pm 140.1 \mu\text{m}$ ($p = 0$) at 6th month after additional treatment. No significant changes were observed in IOP at last follow-up.

Conclusions: IVDI produced significant improvements at the first 3 months in patients with persistent DME. However, additional treatment with IVRB became necessary in order to sustain this improvement, after the 3rd month.

Acknowledgements: The authors thank Dr. Beyhan Özyurt, for her assistance with statistical analysis.

Keywords: Anti-vascular Endothelial Growth Factor, Combination Therapy, Dexamethasone, Diabetic Macular Edema, Ranibizumab.

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Electroretinographic Changes in Response to Intravitreal Ranibizumab Treatment in Patients with Diabetic Macular Edema

Umit U. Inan, Kenan Yigit, Sibel Inan, Mustafa Dogan, Guliz F. Yavas

Kocatepe University Medical School Department of Ophthalmology, Afyon, Turkey

Introduction: To establish whether an improvement in neuroretinal function accompanies to probable improvements in visual acuity and macular thickness with intravitreal ranibizumab treatment in patients with diabetic macular edema (DME).

Methods or Study Design: Sixty-four patients with diabetic macular edema were enrolled in this prospective, interventional study. The patients were treated by monthly injections of intravitreal ranibizumab over 3 months and PRN regimen during the follow-up period of at least 12 months. In all monthly visits, best-corrected visual acuity (BCVA) and optical coherence tomography (OCT) were performed. In addition, mf-ERG recordings were obtained at month 0,3, 6,9 and 12 and ff-ERG was performed at baseline and month 12.

Results: Fifty-eight patients completed the study. Mean injection rate over the one year was 6.1. BCVA improved from 0.30 to 0.45. Macular thickness decreased from $413.5 \mu\text{m}$ to $329.5 \mu\text{m}$ at month 12. Recording of mf-ERG N1 mean value amplitude density of central macular zone was increased from -20.3 nv/deg^2 at baseline, to -21.6 nv/deg^2 at month 6, -22.0 nv/deg^2 at month 9 and -23.6 nv/deg^2 at month 12. In addition, as a recording of mf-ERG P1 mean value amplitude density of central macular zone was increased from 39.8 nv/deg^2 at baseline, to 42.6 nv/deg^2 at month 6, it was decreased to 37.6 nv/deg^2 at month 9 and increased to 44.7 nv/deg^2 at month 12. Improvements in BCVA and OCT assessments were statistically significant in all visits. Statistically significant improvement in mean value of central mf-ERG recordings was started at month 6 and continued until to month 12.

Conclusions: While BCVA and macular thickness improves in even early term in response to the ranibizumab treatment, improvement in neuroretinal function takes a longer time in patients with diabetic macular edema.

Acknowledgements: Kocatepe University Committee of Scientific Research Projects.

Keywords: Mf-ERG, Ff-ERG, OCT, DME, Ranibizumab.

Intra-Vitreous Injection of Tri-Aminolone Acetonide versus Bevacizumab for Management of Diabetic Macular Edema after Phaco Emulsification

Amr Abdel-Fattah Gab-Alla¹, Ehab Mahmoud Ghoniem², Ahmed Anwar Abdel-Ghany¹, Ahmed El-Masry²

¹Faculty of Medicine, Ismailia, Egypt; ²Suez Canal University, Ismailia, Egypt

Introduction: Several studies were done to assess macular edema after phaco-emulsification and after phaco-emulsification with intra-vitreous injection of either tri-aminolone acetonide or bevacizumab.

Methods or Study Design: Pre operative BCVA was recorded, Preoperative assessment with fluorescein angiography (FFA) and optical coherence tomography (OCT) was recorded, the patients were divided into three groups, for all groups phacoemulsification and posterior chamber intra ocular lens was done then in group A intra vitreal injection of triamcinolone acetonide was done, group B intravitreal injection of bevacizumab was done, and group C only phacoemulsification and posterior chamber IOL was done, post-operatively BCVA for each patient in each group and post operative FFA and assessment of the macular thickness with OCT were taken and recorded.

Results: The study was carried on 39 patients, in Group A there was improvement of macular edema and reduction of central macular thickness post operative, also best corrected visual acuity was improved. In Group B and Group C there was deterioration of macular edema and increases in central macular thickness post operative but best corrected visual acuity improved post operative.

Conclusions: Patients with cataract and diabetic macular edema it's recommended to give an intravitreal injection of triamcinolone acetonide at the end of cataract surgery.

Acknowledgements: To my Family.

Keywords: Intra-Vitreous Injection, Phacoemulsification, Optical Coherence Tomography, Fluorescein Angiography.

Intravitreal Bevacizumab with Prompt Laser Compared with Steroid with Prompt Laser and Prompt Laser Alone for Treatment of Diffuse Diabetic Macular Edema

Usama Ahmed Shalaby, Tarek Tawfik Soliman, Ashraf Abdelhameed Alshayeb

Benha University, Benha, Egypt

Introduction: This study compares three treatment modalities for management of diffuse diabetic macular edema: combined intravitreal bevacizumab (IVB) injection plus prompt laser versus combined intravitreal triamcinolone acetonide (IVT-A) injection plus laser or prompt laser alone.

Methods or Study Design: Sixty diabetes mellitus (type 2) patients with diffuse macular edema (DME) (35 males and 25 females)

males) were recruited for this prospective randomized clinical study. Patients were subdivided into three groups: combined laser + intravitreal bevacizumab or laser + intravitreal triamcinolone acetonide and laser photocoagulation alone. Patients in the first two groups had received intra vitreal injections at base line, 2nd month and 4th month followed by focal/grid laser within a week from the first injection. Patients were followed up clinically and with optical coherence tomography every 2 month for one year, for detection of improvement and any adverse effects.

Results: After 12 month follow-up, IVB+laser group showed a highly significant decrease in central macular thickness (CMT) than that occurred with the other two groups (P value <0.0001). Also, it showed the highest significant decrease in CMT than that of the baseline, while the Laser – only treated group showed the least significant change in CMT than baseline (-156.5 ± 33.47 versus -139.3 ± 42.43 respectively). In addition, the visual acuity letter score showed a higher significant improvement in IVB+laser group ($p < 0.008$) than the IVTA+Laser group ($p < 0.048$) in comparison to the laser only treated group. The most commonly recorded adverse effects during the period of follow-up were increased IOP, accelerated cataract formation with the highest incidence of these complications in the IVTA+laser group.

Conclusions: Combined IVB+laser photocoagulation provides a high early and prolonged efficacy in improving visual acuity and reducing macular thickness in treating DME compared with laser only or combined laser and IVTA.

Acknowledgements: None.

Keywords: Bevacizumab, Macular Edema, Triamcinolone.

Treatment Selection after Screening by Clearpath DS-120 Lens Fluorescence Biomicroscope in Diabetic Patients

Federico Selvi, Maurizio Battaglia Parodi, Rosangela Lattanzio, Francesco Maria Bandello

Ophthalmology Department, Ospedale San Raffaele – University Vita Salute, Milan, Italy

Introduction: To assess Clearpath DS-120 Lens Fluorescence Biomicroscope (Freedom Meditech, San Diego, CA) as screening test for the management of patients affected by diabetic retinopathy (DR).

Methods or Study Design: Overall, 100 patients were included in the study. All patients underwent an ophthalmologic examination complete of lens fluorescence biomicroscopy. A control group of 30 healthy subjects were considered for the data comparison.

Results: Overall, the mean fluorescence ratio (FL-Ratio) was 0.2886 in the 100 patients and 0.1693 in the 30 controls ($p < 0.001$). Mean FL-Ratio was 0.2488, in the 34 diabetic patients without DR, and 0.3088 in the 67 diabetic patients with DR, with statistically significant difference ($p < 0.001$). Receiver operating characteristic (ROC) analysis for presence of DR showed a cut-off of 0.2550 in patients under 50 years of age (sensitivity 92%, specificity 90%, AUC = 0.961) and of 0.2650 in patients over 50 years of age (sensitivity 73.8%, specificity 73.5%, AUC = 0.772). All the patients revealing FL-Ratio greater than 0.25 were more further investi-

gated with fluorescein angiography and optical coherence tomography, showing that 29.3% had diabetic macular edema and 26.6% proliferative DR, and received specific treatment. In particular, 23 patients (18%) underwent intravitreal anti-VEGF, 8 patients (9%) received dexamethasone implant, and 47 patients (51%) required laser photocoagulation.

Conclusions: FL-Ratio values can effectively separate patients affected by DR from control subjects. In addition, FL-Ratio greater than 0.25 suggests that patients are involved by DR, leading to a specific treatment algorithm. Our results indicate that Clearpath DS-120 Fluorescence Biomicroscope can be a useful screening test for DR.

Acknowledgements: Grateful to the Ophthalmology department of San Raffaele Hospital.

Keywords: Clearpath DS-120, Lens Fluorescence, Diabetic Retinopathy, Screening, Treatment Selection.

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The Role of Optical Coherence Tomography in Diabetic Retinopathy Screening

Sonia Modi Zachariah¹, Fiona Heggie¹, William Wykes¹, Zachariah Koshy²

¹Glasgow Royal Infirmary, Glasgow, United Kingdom;

²University Hospital Ayr, Ayr, United Kingdom

Introduction: The Greater Glasgow and Clyde diabetic retinopathy screening (DRS) service caters to a population of 1,199,600. This is a 3 tier screening program with digital photography of the fundus with an automated grading system forming the 1st tier followed by 2 further tiers of manual grading. The 3rd tier is arbitrated by an ophthalmologist who will decide which patients need to be referred to an ophthalmology clinic based on photographic evidence of maculopathy.

The current referral rate to these clinics is 4%.

This study aimed to assess the impact of optical coherence tomography (OCT) within the screening service on the referral rates to ophthalmology clinics.

Methods or Study Design: All patients that were being referred to eye clinics with maculopathy were invited to attend an OCT clinic within the DRS with the aim of looking for macular thickening or edema. These patients would be further referred to the tertiary ophthalmic clinic.

Patients without the above findings were referred back to the DRS review cycle.

Results: The study ran between January 2013 to December 2014.

A total of 3884 patients were deemed referable according to the screening protocol (4% of total subjects screened).

Of these 725 patients with maculopathy were called for OCT screening (18.6% of the cumulative referrals).

Of these 725 patients, 99 were found to have features on OCT requiring further referral to the eye clinic (13.6%).

This reduced the total number of patients referred to the ophthalmic clinic by 16%.

Conclusions: The use of OCT reduced the referral rates to tertiary ophthalmic clinics and acts as an effective filter for treatable maculopathy in a diabetic retinopathy screening program.

Acknowledgements: Diabetic Retinopathy Screening Service of NHS Greater Glasgow and Clyde.

Keywords: Diabetic Retinopathy, Screening, Optical Coherence Tomography.

Imaging

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Evaluation of the Innermost Retinal Layers and Visual Evoked Potentials in Patients with Multiple Sclerosis

Ebru Esen¹, Selcuk Sizmaz¹, Mehmet Balal², Kemal Yar¹, Meltem Demirkiran², Nihal Demircan¹

¹Cukurova University, School of Medicine, Department of Ophthalmology, Adana, Turkey; ²Cukurova University, School of Medicine, Department of Neurology, Adana, Turkey

Introduction: The present study is conducted to evaluate the thickness of inner retinal layers and to assess potential associations of structural measures with electrophysiological functions in eyes of patients with Multiple Sclerosis (MS), to provide insights about the pathophysiology of the disease. The correlation between the thicknesses of inner retinal layers and disease disability was also studied to figure out if they might be potential markers of disease burden.

Methods or Study Design: Ninety four eyes of 47 MS patients, and 60 eyes of 30 healthy individuals were included in the study. All patients underwent complete ophthalmological examination and optic coherence tomography imaging to analyze peripapillary retinal nerve fiber layer (RNFL) and ganglion cell-inner plexiform layer (GCIPL) thickness. Visual evoked potentials (VEP) and expanded disability status scale (EDSS) score were assessed for MS patients.

Results: There was a significant reduction in RNFL and GCIPL thickness in MS patients when compared to healthy controls ($p < 0.001$ for both). RNFL thickness correlated with GCIPL thickness in MS eyes ($r = 0.69$, $p < 0.001$). The reduction of RNFL and GCIPL thickness were statistically correlated with the delay in VEP latency ($r = -0.40$, $p < 0.001$ and $r = -0.36$, $p < 0.001$ respectively) in MS eyes. The reduction in GCIPL thickness correlated significantly with the reduction of VEP amplitude in eyes of MS patients with previous optic neuritis history ($r = 0.34$, $p = 0.032$). No significant correlations were found between OCT measurements and EDSS score.

Conclusions: The results demonstrated that innermost layers of retina are highly affected by the pathophysiologic processes in MS disease and the structural changes have correlation with alterations in electrophysiological potentials showing the optic pathway dysfunction.

Acknowledgements: The authors have no financial relationships with any commercial interest related to the content of this study.

Keywords: Multiple Sclerosis, Retinal Nerve Fiber Layer, Ganglion Cell-Inner Plexiform Layer, Visual Evoked Potentials, Disease Disability.

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Choroidal Thickness and Central Foveal Thickness in Patients with Scleroderma: A Controlled Study

Erdinc Aydin¹, Sevinc Sahin Atik², Feray Koc², Melike Balikoglu Yilmaz¹, Sirin Akin Sari³, Mustafa Ozmen³, Servet Akar⁴

¹Izmir Katip Celebi University, Faculty of Medicine, Department of Ophthalmology, Izmir, Turkey; ²Izmir Katip Celebi University, Ataturk Training and Research Hospital, Eye Clinic, Izmir, Turkey; ³Izmir Katip Celebi University, Ataturk Training and Research Hospital, Rheumatology Clinic, Izmir, Turkey; ⁴Izmir Katip Celebi University, Faculty of Medicine, Department of Rheumatology, Izmir, Turkey

Introduction: To employ enhanced depth imaging-optical coherence tomography (EDI-OCT) to analyze the morphological changes in choroid and fovea in patients with scleroderma.

Methods or Study Design: Observational, cross-sectional study.

Primary outcome measures were the changes in choroidal thickness (CT) and central foveal thickness (CFT).

Results: The mean foveal CT was not significantly different in the scleroderma group compared with the control group for both the right ($p = 0.96$) and left ($p = 0.94$) eyes. Analysis of averaged measurements of all 5 points obtained per patient revealed similar results (271.9 ± 46.9 vs. 276.6 ± 54.9 μm at T1.0 point, $p = 0.71$; 226.3 ± 50.6 vs. 224.0 ± 55.3 μm at T3.0 point, $p = 0.86$; 279.1 ± 53.3 vs. 287.0 ± 67.8 μm at N1.0 point, $p = 0.60$; and 198.7 ± 37.0 vs. 183.0 ± 52.7 μm at N3.0 point, $p = 0.17$) in the right eye and 273.8 ± 49.0 vs. 288.9 ± 53.7 μm at T1.0 point, $p = 0.24$; 227.0 ± 42.9 vs. 210.9 ± 45.1 μm at T3.0 point, $p = 0.14$; 266.2 ± 54.3 vs. 262.5 ± 47.1 μm at N1.0 point, $p = 0.77$; and 196.9 ± 46.1 vs. 179.0 ± 48.9 μm at N3.0 point, $p = 0.13$ in the left eye of patients and healthy controls. Patients with scleroderma also showed similar CFT in the right and left eyes compared with healthy controls (229.3 ± 28.6 vs. 232.6 ± 29.7 μm , $p = 0.65$ and 219.8 ± 21.4 vs. 223.3 ± 21.9 μm , $p = 0.51$, respectively).

Conclusions: Choroidal thickness at five points of a horizontal section and CFT in both eyes does not significantly differ in the patients with scleroderma compared with healthy control subjects. The definition of possible change in CT and CFT in further studies may be beneficial for future therapeutic implications.

Acknowledgements: None of the authors has any financial or proprietary interest in any method or material mentioned, herein.

Keywords: Coroidal Thickness, Enhanced Depth Imaging Optical Coherence Tomography, Foveal Thickness, Scleroderma.

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The Incidence of Flat Irregular Retinal Pigment Epithelium Detachments in Chronic Central Serous Chorioretinopathy: Analyses of Clinical Characteristics

Sibel Demirel, Ozge Yanik, Figen Batioglu, Emin Ozmert

Ankara University Medical Faculty Department of Ophthalmology, Ankara, Turkey

Introduction: To define the incidence of flat irregular pigment epithelium detachments (PED) and its association with choroidal neovascularization (CNV) in chronic central serous chorioretinopathy (CSC).

Methods or Study Design: The records of 33 eyes of 30 patients with chronic CSC were retrospectively evaluated. Optical coherence tomography (OCT), fundus autofluorescence (FAF), fluorescence angiography (FA), and if available indocyanine green (ICGA) images were reviewed.

Results: Of the 33 eyes, 5 eyes showed flat PEDs on macular OCT examination. The mean age was 67.6 ± 13.4 (52–87) years. The mean duration of the follow up was 44.2 ± 35.9 months (range: 18–101 months). In all eyes with flat irregular PED, no signs of CNV were detected by OCT and FA at baseline. The pictures were typical for CSR except for irregular, subtle PED. In 3 of 5 eyes, the thicknesses of choroid were thick suggestive for CSR. Among these 5 eyes, 3 eyes were refractory to a various combination of standard CSC treatments including low fluence photodynamic therapy, subthreshold micropulse yellow wave-length laser. In these patients, although there was no characteristic findings for occult CNV, aflibercept injections were given with 3 loading doses and PRN regimen upon suspicion of CNV. The positive treatment results were obtained after 3–5 injections. In the remaining 2 eyes, flat irregular PED were stable over time with no evidence of active neovascularization.

Conclusions: Flat PEDs could be observed in patients with chronic CSC. This finding is not always accompanied by CNV. However, in patients who are not responding to standard CSC treatment, the possibility of the complicating occult CNV should always be kept in mind even if the findings are suggestive for CSC rather than CNV. Multimodal retinal images should be reassessed and intravitreal Anti-VEGF therapy should be considered even if no response to initial injections.

Acknowledgements: None of the authors have any proprietary interests or conflicts of interest related to this submission. None of the authors have any financial support.

Keywords: Central Serous Chorioretinopathy, Occult Choroidal Neovascularization, Photodynamic Therapy, Micropulse Laser, Flat Irregular Pigment Epithel Detachment.

Choroidal Thickness in Patients with Scleroderma

Erol Coskun, Bünyamin Kisacik, Serhat Kenan, Gezmis Kimyon, Kadir Erdogan Er, Orhan Zengin, Ahmet Mesut Onat, Ibrahim Erbagci

Gaziantep University, Gaziantep, Turkey

Introduction: Scleroderma (SC) is a chronic multi-system disorder of unknown etiology. In this study, choroidal thickness in SC patients was investigated by using enhanced depth imaging optical coherence tomography.

Methods or Study Design: Forty-six SC patients (3 male, 43 female) and 31 healthy controls (6 male, 25 female) were included in the study. Only left eyes of the patients and control subjects were used in the analyses. Exclusion criteria included diabetes mellitus, history of intraocular surgery or laser treatment, uveitis, age related macular degeneration, central serous chorioretinopathy, amblyopia, high myopia, and poor image quality. Measurements of refractive error, axial length (AXL), and anterior chamber, fundus examination were performed for each subject. The choroidal thicknesses were determined under the fovea, 3 mm nasal to the fovea, and 3 mm temporal to the fovea.

Results: The mean age was 48.2 ± 9.2 in the SC patients and 52.4 ± 12 years in the healthy controls ($p = 0.1$). There were no significant differences between the groups in terms of gender ($p = 0.086$). The mean AXL was 22.80 ± 0.71 in the SC patients and 22.71 ± 0.64 mm in the healthy controls ($p = 0.55$). The mean spherical equivalent refractive error was -0.77 ± 1.93 in the SC patients and -0.06 ± 1.16 diopter in the healthy controls ($p = 0.072$). Nasal, temporal and subfoveal choroidal thicknesses were 148 ± 51.5 , 181.8 ± 62.7 , and 230.5 ± 66.3 in the SC patients and 261.9 ± 66.9 and 276.5 ± 70.2 , and 363.2 ± 83.16 μm in the healthy controls, respectively. The SC patients had significantly thinner nasal, temporal, and subfoveal choroid than the healthy control subjects ($p_1 = 0.012$, $p_2 = 0.046$, and $p_3 < 0.001$, respectively).

Conclusions: The results of this study demonstrated that the choroidal thickness was significantly thinner in the SC patients than in the healthy controls.

Acknowledgements: The authors acknowledge the kind assistant of Dr. Veysi Öner in reviewing the poster.

Keywords: Scleroderma, Choroidal Thickness.

Algorithm Early Diagnosis of Optic Neuritis

Gavhar Husanovna Khamraeva¹, Guzal Husanovna Hakimova²

¹Tashkent Institute of Postgraduate Medical Education, Tashkent, Uzbekistan; ²Tashkent Pediatric Institute, Tashkent, Uzbekistan

Introduction: Existing diagnostic methods of fellow eye injury in patients with optic neuritis (ON) are imperfect, labor-intensive, possess many shortcomings and in vast majority subjective. Therefore, there is a need for elaboration and implementation of new effective methods of early diagnosis.

Methods or Study Design: 75 patients with ON were included into the study. Everyone were examined using static perimetry, optical coherence tomography of the optic nerve and thickness of peripapillary nerve fiber layer, visual evoked potentials to flash and pattern types.

Results: In the early stage of defining the method was static perimetry (sensitivity 94%), followed in descending order VEP and OCT (sensitivity 87% and 84%) and MRI of the brain and orbits (sensitivity 82%).

Conclusions: VEP, static perimetry, MRI of the brain and orbits, as well as OCT allow establishing inflammation of the optic nerve at the early stages of the disease. Complex application of these methods revealed ON to 97% of cases.

Acknowledgements: We have no acknowledgements.

Keywords: Optic Neuritis, Static Perimetry, Visual Evoked Potential, Magnetic – Resonance Tractography.

Purtscher Retinopathy Associated with Significant Abdominal Trauma

Jonathan Thur Sian Yu, Rehana Sadia, Jane Ashworth

Manchester Royal Eye Hospital, Manchester, United Kingdom

Introduction: Purtscher retinopathy is classically associated with trauma, with a particular predominance to that involving thoracic compression. We present a case of Purtscher retinopathy associated with liver laceration secondary to significant abdominal trauma with striking Optos images.

Methods or Study Design: A 21-month-old pedestrian was hit by a car which was reversing. He sustained significant abdominal trauma including an extensive grade 5 liver laceration, bile duct injury and pancreatic laceration diagnosed with computed tomography imaging. Assessment by the paediatric team excluded non-accidental injury and direct ocular trauma and therefore he was not referred until a week later when his mother became concerned regarding his visual behaviour. His vision was 0.4 Cardiff Acuity Cards and there was no motility or anterior segment pathology.

Results: Dilated fundal examination revealed bilateral pre-retinal boat-shaped haemorrhages at the macula with commotio retinae (Berlin's oedema). Optos images clearly show these striking features.

Conclusions: This case highlights the need for detailed retinal examination in cases with significant trauma, even when the eye does not appear to be directly affected externally. Significant retinopathy, such as Purtscher retinopathy, can be easily missed especially if the patient is uncommunicative, such as in sedated patients or young children. Furthermore, this case reiterates the wide-variety of pathology that can present as retinal haemorrhages and illustrates that non-accidental injury is only one of the differential diagnoses that needs to be considered.

Acknowledgements: Prof IA Bruce, Royal Manchester Children's Hospital.

Keywords: Purtscher Retinopathy, Abdominal Trauma, Optos, Retinal Haemorrhages.

Association between Fundus Autofluorescence Patterns and Morpho-Functional Outcomes in Stargardt Disease

Federico Selvi¹, Maurizio Battaglia Parodi¹, Pierluigi Iacono², Francesco Maria Bandello¹

¹Ophthalmology Department, Ospedale San Raffaele – University Vita Salute, Milan, Italy; ²Fondazione G.B. Bietti per l'Oftalmologia, Istituto di Ricovero e Cura a Carattere Scientifico, Rome, Italy

Introduction: To assess the presence of correlation between patterns in near-infrared (NIR) and short-wavelength (SW) fundus autofluorescence (FAF) and morpho-functional outcomes in eyes affected by Stargardt disease.

Methods or Study Design: Overall, 54 eyes of 27 patients were prospectively enrolled. All patients underwent a complete ophthalmologic examination including SW-FAF, NIR-FAF, microperimetry and spectral-domain optical coherence tomography (SD-OCT). The main outcome measures were identification of a correlation between NIR-FAF and SW-FAF patterns within the foveal region and best corrected visual acuity (BCVA) values. Secondary outcome measures were correlation of FAF patterns with SD-OCT findings and retinal sensitivity on microperimetry.

Results: Higher BCVA was reported in eyes showing a pattern of foveal hyper-FAF on NIR-FAF when compared with eyes with a reduced FAF signal (0.44 ± 0.23 LogMAR vs 1.08 ± 0.19 , $p < 0.001$). Similarly, eyes with hyper-FAF showed significantly better mean sensitivity within 2° of the foveal region (6.45 ± 2.39 dB) than eyes with hypo-FAF (0.23 ± 0.45 dB, $p < 0.001$). Moreover, there was no significant difference in BCVA (0.73 ± 0.31 vs 0.83 ± 0.43 , $p = 0.335$) and mean retinal sensitivity (4.34 ± 3.91 dB vs 2.33 ± 2.96 , $p = 0.07$) between eyes with hyper-FAF on SW-FAF and the subgroup with foveal hypo-FAF. A significant correlation was found between the integrity of both the photoreceptor inner/outer segment junction and the photoreceptor outer segment/retinal pigmented epithelium junction with a foveal hyper-FAF pattern on NIR-FAF and a preserved BCVA.

Conclusions: Our data suggests a correlation between NIR-FAF patterns and morpho-functional outcomes in eyes affected by Stargardt disease. Further studies to better understand the importance of NIR-FAF patterns in the clinical characterization of Stargardt Disease would be beneficial.

Acknowledgements: Grateful to the Ophthalmology department of San Raffaele Hospital.

Keywords: Fundus Autofluorescence, Stargardt Disease, Pattern, Morpho-Functional Outcome.

Choroidal Thickness Measurements in Oral Fluoroquinolone Users: A Pilot Study

Alev Ozcelik Kose, Osman Cekic

Department of Ophthalmology, Marmara University Medical School, Istanbul, Turkey

Introduction: To detect possible alterations in choroidal thickness after oral fluoroquinolone use.

Methods or Study Design: Patients treated with oral 400 mg moxifloxacin or 500 mg ciprofloxacin for 14 days for various systemic infectious diseases were included in this prospective study. The study group eyes all had normal fundus appearance and there was no previous history of ocular disease that compromised the choroid. The patients underwent a detailed ophthalmologic examination and measurements of choroidal thickness using enhanced depth imaging optical coherence tomography (EDI-OCT) at baseline as well as the first week and the first month following the treatment. A masked physician performed choroidal thickness measurements from the posterior edge of the retinal pigment epithelium to the chorio-scleral interface from 1.5 mm nasal to and 1.5 mm temporal to the fovea using EDI-OCT. Fifteen age-matched healthy subjects served as controls.

Results: Thirty eyes of 15 patients (%67 female, mean age 45.9 years) were evaluated. Best-corrected visual acuity stayed same following the treatment ($P > 0.05$). The mean choroidal thickness was similar between study and control groups at baseline (213.6 ± 34.9 μ m and 217.6 ± 35.2 μ m, respectively) ($p = 0.25$). The average baseline choroidal thickness in the study group did not change neither at the first week (216.2 ± 38.1 μ m, $p = 0.10$) nor at the first month (224.2 ± 58.2 μ m, $p = 0.8$). Choroidal thickness did not differ between the oral fluoroquinolone users and non-users at the first week ($p = 0.67$) and the first month ($p = 0.75$).

Conclusions: Preliminary results of this study showed that 14 days use of oral fluoroquinolone had no impact on choroidal thickness.

Acknowledgements: Financial Interest: No.

Keywords: Choroidal Thickness, OCT, Oral Fluoroquinolone.

Choroidal Thickness Changes in Connective Tissue Diseases

Erhan Yumusak¹, Murat Kucukcilioglu², Gokhan Ozge², Onder Ayyildiz², Dorukcan Akincioglu²

¹Kirikkale University School of Medicine, Department of Ophthalmology, Kirikkale, Turkey; ²Gulhane Military Medical School, Department of Ophthalmology, Ankara, Turkey

Introduction: To evaluate choroidal thickness (CT) changes in connective tissue disease (CTD) using spectral domain optical coherence tomography (SD OCT) with enhanced depth imaging (EDI).

Methods or Study Design: In this prospective clinical study, we included 34 subjects who were diagnosed as CTD in remission for at least 3 month and 30 age- and gender-matched healthy con-

trols. Central macular thickness (CMT), subfoveal CT, and CT at nasal (N) and temporal (T) distances of 500 μm (N500 and T500, respectively) and 1500 μm (N1500 and T1500, respectively) from the central fovea were measured by EDI OCT.

Results: The mean CMT of the patient group (219.2 μm) was thinner compared to the control group (225.5 μm), but the difference was not statistically significant ($p = 0.2$). At the same time Mean CT values were thinner at all measure points in the CTD subjects. The mean subfoveal CT, N500, N1500, T500 and T1500 were not significantly different in comparison to controls (all $p > 0.05$).

Conclusions: Although our results did not reach statistical significance, we found thinner choroidal tissue in patients with CTD.

Acknowledgements: None.

Keywords: Choroidal Thickness, Connective Tissue Disease, Enhanced Depth Imaging.

Other Retinal Disorders

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Vogt-Koyanagi-Harada Disease Misdiagnosed as Optic Neuritis. One-Year Follow-Up of a Startling Case

Rosario Cobo-Soriano, Inmaculada Lozano-Escobar, Pilar Fidalgo, Jesús Zarallo, Amaya Clement

Hospital Universitario del Henares, Francisco de Vitoria University, Madrid, Madrid, Spain

Introduction: Vogt-Koyanagi-Harada syndrome (VKH) is a bilateral intraocular granulomatous panuveitis which is frequently associated with systemic manifestations such as meningismus, tinnitus, and vitiligo of autoimmune etiology. However, in cases that initially present as a headache with mild bilateral optic disc edema, other conditions such as optic neuritis can be considered delaying the diagnosis.

Objective: To describe a case of misdiagnosis of VKH disease of a 42-year-old woman with an impressive and dramatic picture of bilateral bullous retinal detachment and hand-movements visual acuity.

Methods or Study Design: Case-report.

Results: We report the case of a 42-year-old woman presented with a history of headache and ocular pain debut followed by mild decreased vision and optic disc swelling in both eyes without any extraocular changes. Although the patient was initially examined by an ophthalmologist of an Emergency-service, she was managed during two months by the Neurology-services of two different Centers. When the patient was finally derived to our Ophthalmology-service because of significant worsening of visual acuity (hand-movement/light-perception), she had a bilateral giant-bullous retinal detachment with anterior uveitis. The patient had been treated as an optic neuritis with intravenous steroid bolus for three

times with partial improvement of the symptoms and new relapses, so there was a significant delay of the diagnosis. We report the therapy applied through a one-year follow-up time: initial loading megadose and oral maintenance steroid therapy, periocular steroids, immunosuppressive and biologic therapy, and the evolution until the complete resolution of subretinal fluid and subretinal inflammatory yellow deposits, leading to residual patchy pigment epithelial scars. Final visual acuity at 12-months was 0.2 (OD) and 0.3 (OS). We report the iconographic evolution (retinographies, OCT, autofluorescence, visual field) of the case and review of related literature.

Conclusions: Vogt-Koyanagi-Harada disease should be included in differential diagnosis of bilateral optic neuritis even when extraocular manifestations of the disease are absent.

Acknowledgements: None.

Keywords: Vogt-Koyanagi-Harada, Optic Neuritis, Serous-Retinal-Detachment.

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Intravitreal Bevacizumab Therapy for Treatment of Central Serous Chorioretinopathy

Mehmet Citirik, Kemal Tekin

SB Ankara Ulucanlar Eye Education and Research Hospital, Ankara, Turkey

Introduction: To evaluate the long-term efficacy and safety of intravitreal bevacizumab for the treatment of subretinal fluid accumulation secondary to central serous chorioretinopathy (CSCR).

Methods or Study Design: This retrospective, consecutive, noncomparative case series included 38 eyes of 35 patients (28 females and 7 males) with CSCR that were followed-up in SB Ankara Ulucanlar Eye Education and Research Hospital Retina Clinic between 2010 and 2015. A complete ophthalmological examination including best corrected visual acuity (BCVA), intraocular pressure with applanation tonometry, biomicroscopic examination findings, dilated pupil examination of the posterior segment, optic coherence tomography (OCT), and fluorescein angiography were evaluated at baseline and during follow-up period. Patients were treated with intravitreal injections of 2.5 mg bevacizumab at 6-week intervals until subretinal fluid resolved.

Results: All patients completed 6 months of follow-up. Sixteen eyes (42.1%) received a single intravitreal injection of bevacizumab, 11 eyes (28.9%) received two intravitreal injections, and 11 eyes (28.9%) received third intravitreal injections. The mean initial BCVA was 20/50 (range, 20/125–20/35). Mean overall BCVA was 20/30 (range, 20/50–20/20) on sixth month. Statistically significant improvement in BCVA was established at the 6th month visits compared to the initial BCVA ($p = 0.001$). The central foveal thickness was reduced from an initial value of $415.89 \pm 64.43 \mu\text{m}$ to a postoperative value of $275.94 \pm 39.89 \mu\text{m}$ ($p = 0.0001$). 34 eyes of the 33 patients showed complete resolution of subretinal fluid and the leakage on fluorescein angiography decreased. On the contrary, two patients who were bilateral disease and had a previous CSCR episode did not showed complete resolution of subretinal fluid on OCT. We suggested indocyanine green angiography and photodynamic therapy these two patients. Injection-related complications were not encountered.

Conclusions: Intravitreal bevacizumab therapy resulted in improved visual acuity and anatomical results of central foveal thickness for CSCR. The results suggest a possible role for anti-VEGF agents in treatment of CSCR.

Acknowledgements: None.

Keywords: Bevacizumab, Central Serous Chorioretinopathy, Intravitreal.

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Baseline Characteristics of Latin American Patients with Neovascular Age-Related Macular Degeneration and Diabetic Macular Edema Enrolled in the Luminous Study

Roberto Ramos¹, Arnaldo Bordon², Juan Carlos Ceron Vivas³, Abel Ramirez Estudillo⁴, Nelida Esther Rosso Nano⁵, Juan Pablo Sinisterra⁶, Patricio Rodrigues Valdez⁷

¹Novartis Pharmaceuticals, Buenos Aires, Argentina; ²Hospital de Olhos de Sorocaba, Sao Paulo, Brazil; ³Sociedad de Cirugia Ocular, Bogota, Colombia; ⁴Hospital Oftalmológico Nuestra Señora de la Luz, Mexico, Mexico; ⁵Clínica de Ojos de Concepcion del Uruguay, Concepcion Del Uruguay, Argentina; ⁶Instituto de Ciegos y Sordos INSORP, Cali, Colombia; ⁷Centro de Investigación y Transferencia en Salud del Tecnológico de Monterrey, Monterrey Nuevo León, Mexico

Introduction: LUMINOUS (NCT01318941) is an ongoing, 5-year multicenter, observational study evaluating the long-term safety, effectiveness, treatment patterns and health-related QoL associated with ranibizumab (RBZ) treatment in clinical practice for all licensed indications.

Methods or Study Design: Here, we describe the baseline characteristics of Latin American nAMD and DME patients. These included adult patients (≥ 18 years) who were treatment-naïve or who had received prior therapy (RBZ or other ocular treatment) for approved RBZ indications. Timing of visits and number of injections is at the discretion of the treating physician. Duration of the study is anticipated to be 5 years, with a minimum of 1 year follow-up period per patient.

Results: Of 20,085 patients enrolled globally before the second interim analyses (March 2014), 492 (2.44%) were from Latin America: nAMD patients comprised 60% and 23.5% had DME. Nearly half of nAMD and DME patients were treatment-naïve, and prior ranibizumab was the principal treatment of treatment-experienced patients. Mean ages were similar in the Latin American and global groups for nAMD (75 vs 77 years) and DME (69 vs 64 years) patients. Baseline VAs were higher in the global versus Latin American cohorts for nAMD (treatment-naïve, 48.8 vs 35.6; treatment-experienced, 56.4 vs 40.7) and DME (treatment-naïve 55.8 vs 41.8; treatment-experienced, 57.8 vs 42.0). Median diagnosis-to-treatment time for treatment-naïve patients was longer among Latin Americans and duration of prior ranibizumab therapy was shorter versus the global cohort. Latin American patients also received fewer mean prior injections (nAMD, 3.4 vs 9.8; DME, 2.7 vs 4.4). Nonocular comorbidities in Latin American patients were lower compared to the global cohort.

Conclusions: Latin American LUMINOUS patients had lower baseline VA and proportion of comorbidities compared to the global cohort. The contribution of data from Latin American patients will provide valuable real-world data in a diverse co-morbid patient group for treating physicians in the region.

Acknowledgements: None.

Keywords: Baseline, Characteristics, NAMD, DME.

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Cost-Utility of Ranibizumab versus Aflibercept for Treating Visual Impairment Due to Diabetic Macular Edema in Greece

Georgia Kourlaba¹, John Relakis², Ronan Mahon³, Maria Kalogeropoulou⁴, Georgia Pantelopoulou⁴, Olga Kousidou⁴, Nikos Maniadakis²

¹Collaborative Center for Clinical Epidemiology and Outcomes Research (CLEO), Athens, Greece; ²Department of Health Services Organization, National School of Public Health, Athens, Greece; ³Novartis Ireland Limited, Athens, Greece; ⁴Novartis (Hellas) S.A.C.I., Athens, Greece

Introduction: To conduct a cost-utility analysis of ranibizumab versus aflibercept for the treatment of patients with visual impairment due to diabetic macular edema (DME) in the Greek setting.

Methods or Study Design: A Markov model was adapted to compare the use of ranibizumab 0.5 mg (pro re nata-PRN and treat & extend-T&E) to aflibercept 2 mg (every 8 weeks after 5 initial doses) in DME. Patients transitioned at a 3-month cycle among nine specified health states (including death) over a lifetime horizon. Transition probabilities, utilities as well as DME-related mortality incorporated in the model were extracted from relative clinical trials, a network meta-analysis and other published studies. The drug acquisition and administration costs as well as the costs of blindness and laser surgery were incorporated in the analysis. The analysis was conducted from payer perspective and as such only costs reimbursed by the payer were considered (year 2014). Treatment costs and health outcomes were discounted by 3.5% annually. The incremental cost per quality-adjusted life year (QALY) gained and the net monetary benefit was the main outcome measures. Sensitivity analysis was conducted to test robustness of the model.

Results: The use of PRN and T&E ranibizumab regimens were shown to be cost saving comparing to aflibercept by €2,824 and €22, respectively, and more beneficial in terms of QALYs gained (+0.05) and time without visual impairment (0.031 and 0.034 years), thereby dominating aflibercept. Moreover, ranibizumab used as PRN or T&E resulted in a net monetary benefit of €3,984 and €1,278, respectively. Sensitivity analysis revealed that the net monetary benefit for each regimen remained positive for all tested scenarios.

Conclusions: Both PRN and T&E ranibizumab regimens were more beneficial and less costly compared to aflibercept for the management of DME. Hence, ranibizumab seems to be a dominant option for the treatment of visual impairment due to DME in the Greek setting.

Acknowledgements: The study was supported by Novartis Hellas.

Keywords: Ranibizumab, Aflibercept, Diabetic Macular Edema, Visual Impairment, Cost-Utility.

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Ocular, Tomographic and Electrophysiological Findings in a Patient with Chronic Lead Toxicity

Nakhleh Elias Abu-Yaghi, Ahmed Najeeb Shokry, Mohammad Samir Farah

The University of Jordan, Amman, Jordan

Introduction: A 37 year-old lethargic male patient with a history of chronic occupational lead exposure presented to the retina service with bilateral blurring of vision for a few weeks. He had an unremarkable past ophthalmic history.

Methods or Study Design: Observational case report and review of literature.

Results: The patient's lead serum level was 103 µg/dl (normal level is below 20 µg/dl), indicating chronic lead toxicity from occupational exposure. His best corrected visual acuity was 6/9 in the right eye and 6/12 in the left eye. Anterior segment examination and intraocular pressures were within normal limits. Fundus examination revealed a cherry-red spot –like appearance with an abnormal foveal reflex in both eyes, but both optic nerves appeared normal in shape and color. Optical coherence tomography showed bilateral significant foveal thinning with disruption of the inner segment/outer segment photoreceptor junction that was symmetrical in both eyes. A full field electroretinogram (ERG) was done according to the International Society for Clinical Electrophysiology of Vision standards with the five responses of the standard ERG. The amplitudes of the scotopic rods and combined rod-cone responses were normal. Photopic cone responses and flicker responses were also normal in both eyes. Pattern ERG was also normal with normal amplitudes to both high and low space frequency stimuli.

Conclusions: Chronic cumulative lead exposure can affect the visual system in multiple ways, including cataract formation, optic nerve pallor, narrowed retinal arterioles, pigmentary retinal changes and variably affected rod and cone-mediated electroretinogram responses. A careful approach combining clinical, tomographic and electrophysiological testing can help to discern clues about this unusual and unpredictable condition. In this particular case, tomographic changes antedated the expected abnormalities on the electroretinogram.

Acknowledgements: None.

Keywords: Lead Toxicity, Ocular Coherence Tomography, Electroretinography.

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Evaluation of the Level of Glycoproteins in the Vitreous Body in Degenerative Diseases of the Retina

Ural Rifovich Altynbaev

Medical Center OJSC Tatneft, Almetjevsk, Russia

Introduction: A comparative study of the content of fibronectin and laminin in the vitreous of patients with macular hole (MH), epiretinal membran (ERM) and 'wet' form age-related macular degeneration (AMD).

Methods or Study Design: The evaluation of glycoproteins was made in the vitreous body of 63 patients in the age range of 56 to 81 years (65 ± 2.8 years). The 1 group consisted of 24 patients with MH, the 2 study group comprised of 14 patients with ERM, the 3 group – 15 patients with the wet form of AMD. The control group included 10 patients with contusion dislocation of the lens into the vitreous without signs of retinal pathology.

Results: The study of the patients in the control group revealed the content of laminin in the vitreous around 0.71 ± 0.03 mg/ml and fibronectin 34 ± 5.5 mg/ml and showed no correlation of these parameters with the age and sex of the patients. Indicators of laminin and fibronectin in vitreous in patients with MH were, respectively 0.8 ± 0.23 mg/ml and 32.8 ± 2.1 mg/ml, in patients with AMD -0.9 ± 0.25 mg/ml and 33.0 ± 1.65 mg/ml, and in patients with ERM -0.8 ± 0.23 mg/ml and 32.0 ± 0.53 mg/ml.

Conclusions: The average content of laminin and fibronectin in vitreous of healthy individuals and with different degenerative changes in the retina was obtained. Highly pronounced direct correlation was found between the level of laminin in the vitreous and retinal thickness under MH and ERM.

Acknowledgements: Laminin, fibronectin, epiretinal membranes, age-related macular degeneration, macular hole, vitreous.

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The Effectiveness of Intraocular Methotrexate in the Treatment of Posterior Uveitis in Behçet's Disease Patients Compared to Retrobulbar Steroids Injection

Hossam El Din Mohamed Khalil¹, Hala Ahmed Raafat Youssef², Hazem Effat Haroun¹, Tamer Atef Gheita², Hossam Mahmoud Bakir¹

¹Faculty of Medicine Beni Sweif University, Cairo, Egypt;

²Faculty of Medicine Cairo University, Cairo, Egypt

Introduction: Behçet's disease (BD) is a multisystem disorder that may be associated with uveitis, retinal vasculitis, and optic neuropathy. Methotrexate, is an antimetabolite that was introduced for the treatment of autoimmune diseases.

Methods or Study Design: 31 adult BD patients suffering from BD-associated ocular inflammation with bilateral posterior segment involvement were included in the present study. The age of the patients ranged between 22.3 to 45.1 years and disease duration ranged between 2–12.3 years. Disease activity was assessed

using the BD Current Activity Form (BDCAF) score. All patients underwent complete ophthalmologic examination, which included the best corrected visual acuity testing (VA), slit-lamp biomicroscopy, tonometry, and indirect ophthalmoscopy. Injection of 400 µg/0.1 ml of MTX intravitreally was done in one eye and retrobulbar injection of steroids was done in the other eye.

Results: In MTX injected eyes visual acuity (initially 2.9000 ± 2.1000 and became 4.6800 ± 3.2000 $p = 0.0121$) significantly improved in 24 eyes (77.4%) at the follow up period after methotrexate treatment, while in steroids injected eyes VA improved significantly (2.13 ± 1.94 to 4.97 ± 2.3 $p < 0.0001$) and improvement observed in 27 patients (87.1%) patients. The mean duration of remission in MTX injected eyes was 20.6 ± 2.1 weeks was longer than mean duration of remission in steroids injected eyes 5.3 ± 0.9 , and this difference is considered to be extremely statistically significant (p less than 0.0001).

Conclusions: Intravitreal MTX can improve VA and reduce posterior segment manifestations in BD patients with longer duration of remission compared to retrobulbar steroid injection.

Acknowledgements: I'd like to express my sincere thanks to all my colleagues and patients. None of the authors provided any financial support. None of the authors have any proprietary interests or conflicts of interest related to this submission.

Keywords: Behcet Disease, Posterior Uveitis, Methotrexate, Retrobulbar Steroid.

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The Effectiveness of Pre and Post Operative Infliximab in Controlling Behçet's Disease Posterior Uveitis in Patients Undergoing Vitrectomy

Hossam El Din Mohamed Khalil¹, Hala Ahmed Raafat Mahrous², Hazem Effat Haroun¹, Tamer Atef Gheita², Hossam Mahmoud Bakir¹

¹Faculty of Medicine Beni Sweif University, Cairo, Egypt;

²Faculty of Medicine Cairo University, Cairo, Egypt

Introduction: Infliximab is a chimeric monoclonal antibody inhibiting TNF-α essential for rapid and effective suppression of the acute ocular inflammation and extraocular manifestations of Behçet disease.

Methods or Study Design: Twenty-seven male BD patients candidate for vitrectomy were included. Each patient underwent complete ophthalmologic examination including the best corrected visual acuity (VA) testing. Infliximab was given in a dose of 5 mg/kg intravenous infusion over a three-hour period once every two weeks for 3 treatment sessions before and for a further 3 sessions after vitrectomy.

Results: The mean age of the patients was 30.6 ± 5.16 years and disease duration was 6.3 ± 3.1 years. Improvement of ocular manifestations was detected after infliximab treatment in 22 (81.5%) patients. The mean VA remarkably improved (2.4 ± 1.03 to 4.7 ± 1.1 ; $p < 0.0001$), the erythrocyte sedimentation rate significantly decreased from 74.12 ± 20.4 to 55.3 ± 14.32 mm/hr ($p = 0.0003$). The dose of steroids significantly decreased from 42.3 ± 6.21 to 19.6 ± 8.5 mg/day ($p < 0.0001$). Twenty-one (77.8%) patients were

able to taper the steroid dose, while 4 (14.8%) had stable ocular condition but unable to taper the steroids. Only two patients (7.4%) suffered worsening of their ocular condition that required increased dose of corticosteroids and shift to other cytotoxic medications. All patients showed good tolerance to infliximab during the 6 treatment sessions, without any serious side effects necessitating its stoppage.

Conclusions: Infliximab treatment is effective in controlling ocular manifestations in BD patients indicated for vitrectomy and useful treatment option for those patients with severe refractory posterior uveitis not responding to immunosuppressive drugs.

Acknowledgements: I'd like to express my sincere gratitude to all my colleagues and patients. None of the authors have any proprietary interests or conflicts of interest related to this submission.

Keywords: Behcet Disease, Posterior Uveitis, Infliximab, Vitrectomy.

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The Use of Intravitreal Steroid Implant for Treatment of Refractory Cystoid Macular Edema Secondary to Retinitis Pigmentosa

Fawwaz Falih Al Mamoori, Sibel Demirel

Eye Specialty Hospital, Amman, Jordan

Introduction: Retinitis pigmentosa is a clinically and genetically diverse group of diffuse retinal dystrophes that initially affecting rod cells with subsequent degeneration of cones.

Maculopathy is one of complications of RP that affecting vision and usually takes different types 1. (Atrophic), 2. (Cystoid Macular Edema) 3. (Macular retraction).

The prevalence of CME was 52% in AD RP, 39% in AR RP and 35% in XL.

Methods or Study Design: We retrospectively review a 24 y old male patient that presented with bilateral refractory cystoid macular edema secondary to RP which is not responding to topical carbonic anhydrase inhibitor and multiple anti VEGF injections of Lucentis in both eyes, the patient underwent bilateral 0.7 mg intravitreal dexamethason (OZURDEX) implant of 1 week apart, the spectral domain OCT was performed before and one month after OZURDEX injection and to assess the efficacy of intravitreal steroid implants in treatment of refractory CMO in RP.

Results: The Spectral Domain OCT after 1 month of injection showed a significant anatomical and functional improvements, CMT improved from 651 µm to 218 µm in the right eye and from 359 µm to 245 µm in the left eye. The BCVA improved from 6/60 to 6/12 in the right eye and from CF 1 meter to 6/60 in the left eye.

Conclusions: It seems that the refractory CMO in RP is mostly inflammatory driven, for this reason it shows a dramatic response to intravitreal steroids, in our case, the patient has received multiple anti VEGF injections of Lucentis with no improvement, but he responded very well anatomically and functionally to intravitreal steroid implant of OZURDEX, the results in our case was matching other small case series results, EX: In retrospective study of Ozdemir et al reported the efficacy of intravitreal steroid in a group of five eye of five patients.

Further preferably randomised trials may establish the place of intravitreal dexamethason in the treatment of refractory CME related to RP.

Acknowledgements: This material based on our clinical practice in EYE SPECIALTY HOSPITAL (AMMAN, JORDAN), Any options, findings and conclusions or recommendations expressed in this material are those of author.

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Effect of Macular Structure on Visual Acuity in Retinal Detachment

Handan Bardak, Yavuz Bardak

Isparta Career Eye Hospital, Isparta, Turkey

Introduction: The aim of the study was to investigate effect of macular structure on corrected visual acuity (CVA) following successful retinal detachment surgery.

Methods or Study Design: Nineteen eyes of 19 patients with macula involved rhegmatogenous retinal detachment had pars plana vitrectomy. Central macular thickness (CMT), macular sub-retinal fluid height (MSFH) and macular structure were analysed with optical coherence tomography (OCT). Healthy other eyes were accepted as control group. Time period for detached retina was asked to patients.

Results: Preoperative CVA was 1.56 ± 0.67 LogMar, postoperative 3th months CVA was 0.61 ± 0.34 LogMar, postoperative 6th months CVA was 0.46 ± 0.34 LogMar. There were significant increase in postoperative 3th and 6th months CVA ($p = 0.001$). At postoperative 6th months CMT were 179.21 ± 40.46 μ m in operated eyes and 212.53 ± 36.47 μ m in control eyes ($p = 0.002$). There was a correlation between preoperative CVA and MSFH ($r = 0.512$ $p = 0.025$). There were correlations between postoperative 3th months CVA and MSFH, outer retinal corrugation, intraretinal separation, intraretinal cystic changes, IS/OS band disturbance ($p < 0.05$). There were correlations between postoperative 6th months CVA and MSFH, outer retinal corrugation, intraretinal separation, intraretinal cystic changes, IS/OS band disturbance ($p < 0.05$). There were subretinal fluid in 3 (%15.79) patients at postoperative 3th months control. There were subretinal fluid in 2 (%10.53) patients cystoid macular oedema, 1 (%5.26) patients epiretinal membrane patients at postoperative 6th months control. There was not subretinal fluid in any patients at postoperative 6th months control.

Conclusions: Anatomic success and functional success may not be parallel in retinal detachment surgery. Macular structure may be effective on CVA.

Acknowledgements: There is not any financial interest of authors for this study.

Keywords: Corrected Visual Acuity, Macular Structure, Optical Coherence Tomography, Rhegmatogenous Retinal Detachment.

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Effect of Religious Fasting on Choroidal and Macular Thickness

Necati Duru, Zeynep Duru, Mustafa Atas, Arzu Seyhan Karatepe Hashas, Döndü Melek Ulusoy, Hasan Basri Arifoglu, Süleyman Demircan

Kayseri Education and Research Hospital, Department of Ophthalmology, Kayseri, Turkey

Introduction: Islamic Ramadan is the month of fasting, in which intake of food and drink is restricted from sunrise until sunset. The objective of the present study was to find out the effect of religious fasting on choroidal and macular thickness.

Methods or Study Design: In this prospective study, 26 eyes of 26 healthy volunteers with a mean age of 34.62 ± 8.40 years were enrolled. Volunteers with any systemic disorder and eyes with pathology or previous surgery were excluded. Before (non-fasting period) and during (fasting period) Ramadan at the same hours (at 4.00 pm), central and paracentral macular thickness in the four quadrants and subfoveal choroidal thickness (SFCT) were measured by optical coherence tomography (Spectralis OCT, Heidelberg Engineering, Dossenheim, Germany). Results were compared using paired sample t test, and a p value less than 0.05 was accepted as statistically significant.

Results: Comparison of measurements between fasting and non-fasting periods revealed significantly lower values for SFCT ($p < 0.001$) and paracentral macular thickness in four quadrants (superior quadrant; $p = 0.001$, inferior quadrant; $p = 0.015$, temporal quadrant; $p = 0.014$, nasal quadrant; $p = 0.026$) during fasting period. Conversely, there was no significant difference in central macular thickness between fasting and non-fasting periods ($p = 0.211$).

Conclusions: Our results reveal that Islamic Ramadan fasting is associated with statistically significant alterations in choroidal and paracentral macular thickness in healthy volunteers. However, more detailed investigations should be designed to evaluate whether fasting has a pivotal influence on pathological conditions.

Acknowledgements: No author has a financial or proprietary interest in any material or method mentioned.

Keywords: Ramadan Fasting, Optical Coherence Tomography, Choroidal Thickness, Macular Thickness.

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Myopic Choroidal Neovascularization in Clinical Practice: Risk Factors, Clinical Characteristics and Management. Myopathy Study

Jm Ruiz-Moreno¹, Montserrat Roura², On Behalf of The Myopathy Study Group²

¹Universidad Castilla La Mancha, Albacete, Albacete, Spain;

²Novartis Farmacéutica, S.A., Barcelona, Barcelona, Spain

Introduction: The aim was to describe risk factors, clinical characteristics and general disease management of patients with myopic choroidal neovascularization (mCNV) vs. patients with high myopia (HM) without CNV.

Methods or Study Design: Observational, retrospective cohort (review of medical records), cross-sectional, and multicentre study. Two cohorts were designed: cohort-1 (mCNV patients) and cohort-2 (HM patients without CNV). Patients were consecutively recruited (the first 10 patients with mCNV and 3 with HM).

Results: 137 patients in the cohort-1 and 48 patients in cohort-2 (143 eyes cohort-1 and 81 eyes cohort-2) were included (19 centres participated). The cohorts were comparable (cohort-1 vs. cohort-2) regarding sex (female: 82.5% vs. 79.2%), age (median [SD] of 55.1 [12.8] vs. 54.8 [13.8] years) and Body Mass Index (25.8 [5.3] vs. 24.2 [2.7] kg/m²). The main risk factors for developing mCNV (cohort-1 vs. cohort-2) were: family history (48.2% vs. 37.5%, non-significant [NS]), smoking history (24.8% vs. 12.5%, NS) and overweight/obesity (29.2% vs. 10.4%, $p = 0.027$). At diagnosis, the best corrected visual acuity (BCVA) [cohort-1 vs. cohort-2] was 54.0 (17.2) vs. 70.5 (16.4) letters, and at the study visit was 61.2 (18.2) vs. 70.7 (15.2) letters. For cohort-1, the median (Q1, Q3) BCVA change from diagnosis was +5.0 (0.0, 15.0) vs. 0 (-5.0, 5.0) letters. The mean (SD) retinal thickness at diagnosis was 287.3 (95.2) μm and at the study visit was 257.5 (67.3) μm . Therapeutic management in cohort-1 was mainly by antiangiogenic drugs (79.7%; median of 1.8 [1.0] injections per patient).

Conclusions: The main risk factors observed for mCNV were family and smoking history and overweight/obesity, being the last one significantly higher in mCNV patients vs. HM patients without CNV. These risks were higher than in HM patients. Antiangiogenic therapy is the most common treatment for mCNV and those patients showed an improvement in BCVA from diagnosis vs HM without mCNV.

Acknowledgements: The authors thank TFS for the medical writing support.

Keywords: Myopic Choroidal Neovascularization, High Myopia, Antiangiogenic Therapy, Best Corrected Visual Acuity.

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Baseline Characteristics of Patients with Myopic Choroidal Neovascularization: 2015 Interim Analysis of the Real-World LUMINOUS Study

Robin D. Hamilton

Moorfields Eye Hospital, London, United Kingdom

Introduction: LUMINOUS™ is the largest prospective observational trial in medical retina, designed to evaluate the long-term safety, effectiveness, treatment patterns and health-related quality-of-life associated with ranibizumab treatment in clinical practice for all licensed indications from over 30,000 patients across 43 countries. Preliminary results from the cohort of 285 patients with myopic choroidal neovascularization (mCNV) in this third interim analysis i.e. those recruited from study start (March 2011) to March 2015 are described.

Methods or Study Design: Treatment-naïve (T1), prior ranibizumab treated (T2) or other prior ocular treated (T3) patients receiving ranibizumab for this locally approved licensed indication were enrolled.

Results: A total of 29,055 patients were recruited prior to March 2015, of whom 285 had mCNV; 95 in T1, 166 in T2, and 24 in T3. Overall, the mean age for mCNV patients was 58.2, 70.9%

were female, 87.4% were Caucasian and 7.4% were Asian. Mean baseline visual acuity (VA, ETDRS letters) was higher in T2 (58.2) than both T1 (49.8) and T3 (47.1). Median time from diagnosis of mCNV to first ranibizumab treatment was 5.1 days for T1. Time from diagnosis to study entry was 61.6 and 71.2 weeks for T2 and T3 groups, respectively.

Overall, baseline comorbidities included 3.5% of patients with a history of myocardial infarction, 2.5% with a history of stroke, 8.8% with diabetes, 33.7% were hypertensive and 14.0% were obese.

Conclusions:

- LUMINOUS includes mCNV patients from 23 countries across Europe, Asia, South America and Canada, many of which are currently underrepresented in randomized controlled trials.
- Prior ranibizumab treatment was associated with higher VA baseline values than the treatment-naïve patients and those previously treated with other therapies for mCNV.
- Future follow-up data from the mCNV patients recruited will be described and provide important long-term data regarding ranibizumab in real-world clinical practice.

Acknowledgements: Authors received writing support for this abstract from Maryanne Donovan (Global Business Services, Novartis Ireland Ltd.).

Keywords: LUMINOUS, Ranibizumab, Myopic Choroidal Neovascularization, Real-World, Baseline Characteristics.

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Intraocular Cytokines in Patients with Myopic Choroidal Neovascularization

Andrey G. Shchuko, Natalia V. Zaitseva, Tatiana N. Iureva

The Academician S.N. Fyodorov Federal State Institution

«Intersectoral Research and Technology Complex «Eye

Microsurgery» Ministry of Health of Russian Federation», Irkutsk Branch, Irkutsk, Russia

Introduction: Myopic choroidal neovascularization (mCNV) has distinctive features, but angiogenesis regulation in it has not been studied in details. The purpose of the study was to measure intraocular cytokines in mCNV.

Methods or Study Design: 18 patients (19 eyes) with mCNV were included to the study: mean age $\pm$ SD was 48.52 ± 15.49 years; 14 females, 4 males. Mean refractive error -9.44 ± 4.72 D, mean axial length -27.16 ± 2.06 mm. All patients with mCNV were treated with intravitreal ranibizumab. Control group included 14 patients (18 eyes) with myopia who underwent cataract surgery. Control group was comparable with study group. Cytokines were measured in aqueous humor using flow fluorometry with Bio-Plex Pro Human Cytokine Panel, 27-Plex («Bio-Rad Laboratories», USA).

Results: In aqueous humor of patients with mCNV 17 cytokines were detected, the concentrations of 11 cytokines were statistically significantly different compared to control group. The concentration of 10 cytokines was below the threshold of method sensitivity.

VEGF concentration was significantly ($p < 0.05$) lower compared to control group (191.15 ± 142.30 vs 320.06 ± 170.05 pg/ml). The concentrations of other cytokines was significantly ($p < 0.05$)

higher in patients with mCNV than in control: PDGF-BB (21.70 ± 24.89 vs 3.82 ± 6.69 pg/ml), IL-2 (25.11 ± 27.99 vs 7.17 ± 7.86 pg/ml), IL-5 (2.21 ± 1.10 vs 1.42 ± 1.24 pg/ml), IL-8 (33.99 ± 40.61 vs 10.70 ± 8.61 pg/ml), IL-13 (10.03 ± 12.98 vs 4.42 ± 7.40 pg/ml), IL-15 (4.31 ± 3.14 vs 2.90 ± 0.00 pg/ml), IL-17A (27.87 ± 41.07 vs 6.90 ± 0.00 pg/ml), TNF α (15.52 ± 14.49 vs 4.48 ± 8.38 pg/ml), RANTES (20.50 ± 26.70 vs 1.80 ± 0.00 pg/ml) and INF γ (43.78 ± 65.89 vs 19.9 ± 0.00 pg/ml).

Conclusions: Intraocular cytokines profile in patients with myopic choroidal neovascularization is significantly different compared to other retinal neovascular diseases.

Acknowledgements: No.

Keywords: Myopic Choroidal Neovascularization, Intraocular Cytokines, Growth Factors, Ranibizumab, Multiplex Analysis.

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Relationship between Visual Acuity and Ability to Perform Activities in Patients with Diabetic Macular Edema

Victor Barzey¹, Dominic Muston², Christoph Gerlinger³, Adam Lloyd¹

¹IMS Health, London, United Kingdom; ²Bayer HealthCare Pharmaceuticals Inc., Whippany, United States; ³Bayer Pharma AG, Berlin and University Medical School of Saarland, Homburg/Saar, Germany

Introduction: Eye disease can have a devastating impact on patients. However, the relationship between best-corrected visual acuity (BCVA; the primary endpoint in many studies) and ability to perform activities is poorly understood. We explored this relationship in patients with diabetic macular edema (DME).

Methods or Study Design: Data from patients enrolled in two trials of intravitreal aflibercept versus laser were available for analysis (VIVID-DME and VISTA-DME, all treatment arms combined). Patients were aged 18 years or over with Type 1 or 2 diabetes mellitus, DME involving the central subfield and a BCVA between 73 and 24 letters in the affected eye. BCVA in both eyes was measured and patients completed the National Eye Institute Visual Function Questionnaire, a validated questionnaire that includes items relating to performance of usual activities. Data were collected at up to three time points: enrollment, Week 24 and Week 52. Logit and probit models were constructed to consider the impact of BCVA on ability to perform functional activities, adjusted for age and gender.

Results: 867 patients provided 1645 observations. Patients had a mean (SD) age of 63 (9) years and a mean body mass index of 30 (7) kg/m²; 58% were male, and 86% had at least one additional diabetic comorbidity. A 5-letter difference in BCVA in the better-seeing eye was associated with significant difference in the likelihood (Odds Ratio [OR], 95% confidence interval) that the patient was able to read (1.98, 1.70–2.30), drive at night (1.67, 1.34–2.08), and drive in difficult conditions (1.57, 1.26–1.97). For the worse-seeing eye, the respective ORs for a 5-letter difference were 1.17 (1.06–1.29), 1.30 (1.12–1.51), and 1.41 (1.19–1.66).

Conclusions: Visual acuity in both the better- and worse-seeing eye had a significant impact on functional abilities. Im-

provements in BCVA of a magnitude achievable with treatment may have important and measurable benefits for patients with DME.

Acknowledgements: This work was funded by Bayer. DM and CG are employees of Bayer.

Keywords: Functional Status, Best Corrected Visual Acuity (BCVA), Vision-Related Quality of Life (VRQoL), Diabetic Macular Edema.

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Baseline Characteristics of Patients from the Cohort of Russian Patients in the Observational Luminous Study. An Interim Analysis

Valeriy V. Chernykh¹, Mukharrem M. Bikbov², Andrey G. Shchuko³

¹The Academician S.N. Fyodorov Federal State Institution «Intersectoral Research and Technology Complex «Eye Microsurgery» Ministry of Health of Russian Federation», Novosibirsk Branch, Novosibirsk, Russia; ²State Budgetary Institution «Ufa Eye Research Institute of Academy of Sciences of the Republic of Bashkortostan», Ufa, Russia; ³The Academician S.N. Fyodorov Federal State Institution «Intersectoral Research and Technology Complex «Eye Microsurgery» Ministry of Health of Russian Federation», Irkutsk Branch, Irkutsk, Russia

Introduction: To describe baseline characteristics of patients enrolled into the LUMINOUS study in Russia.

Methods or Study Design: LUMINOUS is a global, 5-year, multicenter, observational study aimed at evaluating the long-term safety, effectiveness, treatment patterns and health related quality of life outcomes in patients treated with ranibizumab 0.5 mg in routine clinical practice across all approved indications according to the local label.

Consenting adult patients (≥ 18 years), either ranibizumab treatment naïve or who had received prior ranibizumab for any of the five approved indications included in the local product label.

Results: 944 pts from Russia (4.7% of global cohort), mean age 68.9 yrs, 29.9% – males, 70.1% – females; 585 pts had neovascular age-related macular degeneration (nAMD), 258 pts – diabetic macular edema (DME), 44 pts – branch retinal vein occlusion (BRVO), 57 pts – central RVO (CRVO). 536 pts (56.8%) were treatment-naïve (T1), 220 pts (23.3%) had received ranibizumab (T2) and 188 pts (19.9%) – other ocular treatment before the enrollment. The ratio of treatment-naïve pts to previously treated with ranibizumab pts was 2.4/1 compared with 1/4.2 in global cohort. The mean visual acuity (VA) (approximate EDTRS letter score) was numerically higher in T2 compared to T1 pts in wAMD, BRVO and CRVO (50.9 vs 41.5, 69.0 vs 47.5, 45.6 vs 42.1, respectively) and did not significantly differ in DME (48.2 vs 50.5). Mean central retinal thickness (CRT) in T1/T2 in wAMD, DME, BRVO and CRVO was 370.1/302.6 μ m, 461.7/431.6 μ m, 478.0/402.0 μ m and 514.5/437.5 μ m. The analyzed population characterized by higher proportion of diabetes, hypertension and obesity compared to global cohort.

Conclusions: The patient population recruited to LUMINOUS represents a diverse population, many of whom are not routinely included in randomized controlled trials. The heterogeneity of

country level results to the global cohort, demonstrates the value of individual country analyses.

Acknowledgements: No.

Keywords: LUMINOUS, Interim Analysis.

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Ranibizumab in the Treatment of Choroidal Neovascularization in Complicated Myopia

Olga Vasilevna Zhiliaeva, Irina Evgenevna Pavova, Marina Urevna Prokopyeva

South Ural State Medical University of the Ministry of Health of Russian Federation, Chelyabinsk, Russia

Introduction: Estimation of efficiency of treatment choroidal neovascularization in complicated myopia ranibizumab.

Methods or Study Design: The study included 66 patients (71 eyes) with myopic choroidal neovascularization (CNV). All patients were divided into two groups: axial length of the eye was up to 25 mm (the mean 23.21 ± 0.82) in the first group (Group 1, 21 patients, 21 eyes) and more than 25 mm (the mean 28.32 ± 2.34) in the second group (Group 2, 45 patients, 50 eyes). The mean age was 62.8 ± 15.1 and 58.2 ± 9.8 years, respectively. Mean time of observation 32.8 ± 19.1 months. Mean changes in BCVA before treatment 0.25 ± 0.23 and 0.22 ± 0.21 , respectively. All patients were examined using OCT (RTVue 4.0, Optovue) to assess height of the neuroepithelium, CNV size, OCT angiography (RTVue XR Avanti, Optovue) to assess shape, level, area of CNV. Mean number of injections Ranibizumab – 1.15 ± 0.61 and 1.81 ± 1.41 , respectively.

Results: Showed improvement or stabilization of the height of the neuroepithelium, BCVA, CNV size in both groups after treatment ranibizumab ($p < 0.05$). The mean time of recurrence for the first group occurred in the 19–24 month follow-up period (45.5 ± 10.1 , $M\% \pm m$, $n = 21$) and for the second group – 12 months (42.2 ± 11.6 , $M\% \pm m$, $n = 50$), significantly. Group 2 had degenerative changes more pronounced than in Group 1 ($p < 0.05$). We have been diagnosed shape loops, glomerular and treelike CNV using OCT angiography ($n = 4$, CNV area $0.375 \pm 0.409 \text{ mm}^2$; $n = 6$, CNV area $0.563 \pm 0.297 \text{ mm}^2$; $n = 4$, CNV area $0.563 \pm 0.297 \text{ mm}^2$, respectively; a total of 14 eyes). Mean number of injections was to shape loops 1.0 ± 0.0 , glomerular 2.01 ± 1.7 , treelike 1.25 ± 0.5 .

Conclusions: Ranibizumab is effective in evaluating the course of the CNV in complicated myopia. Duration of remission depends on the axial length of the eye, the severity of degenerative changes in the fundus. OCT angiography allows to evaluate the effectiveness of treatment and requires further study.

Acknowledgements: None.

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Retinal Deep Capillary Ischemia in a Patient with Antiphospholipid Syndrome

Serra Arf, Isil Sayman Muslubas, Murat Karacorlu, Mumin Hocaoglu
Istanbul Retina Institute, Istanbul, Turkey

Introduction: Retinal deep capillary ischemia (DCI) may represent a nonspecific finding of retinal ischemia, causes characteristic changes within the middle retinal layers and it may difficult to detect on clinical examination.

Methods or Study Design: Case Report.

Results: A 53-year-old woman was examined with a 1-week history of sudden onset of decreased vision in the RE. BCVA on presentation was 0.3–0.4 in the RE and 0.7 in the LE. The IOP was 15 mm Hg in the RE and 26 mm Hg in the LE. Anterior segment was unremarkable in both eyes. Fundus examination was unremarkable in the RE and one soft exudate nasal to the optic disk and a small flame shaped hemorrhage temporal to the optic disk were in the LE.

FAF of the RE indicated slightly hypofluorescent flecks around the fovea.

In microperimetry fixation was unstable in the RE with 0.4 dB threshold, and absolute scotoma; fixation was stable in the LE with 10.9 dB retinal threshold.

SD-OCT showed increased reflectivity of middle retinal layers in the right eye, left eye showed no significant changes.

FA was carried out, which confirmed the staining of the macular vessels in the midphase and capillary closure between these arteries, and ICGA highlighted the same change in the RE. There was no significant abnormality in the LE, with small hypofluorescences due to the retinal hemorrhage, and soft exudate.

She was diagnosed with DCI in the RE. Nerve fiber layer hemorrhage was thought as secondary to glaucoma in the LE, and glaucoma medication was started. Laboratory evaluation revealed abnormal titers of lupus anticoagulant antibodies and Antiphospholipid Syndrome was diagnosed by a rheumatologist.

Conclusions: In conclusion DCI may represent characteristic changes within the middle retinal layers and OCT is the most specific technique in detecting these lesions. DCI may be a complicating feature of an underlying disease such as Antiphospholipid Syndrome.

Acknowledgements: The authors have no conflict of interest.

Keywords: Retinal Deep Capillary Ischemia, Optical Coherence Tomography, Fluorescein Angiography, Antiphospholipid Syndrome.

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Macular Telangiectasia or Diabetic Macular Edema?

Mumin Hocaoglu, Murat Karacorlu, Serra Arf, Isil Sayman Muslubas
Istanbul Retina Institute, Istanbul, Turkey

Introduction: Idiopathic macular telangiectasia (Mac Tel) is associated with dilated retinal capillaries which leak into the retina causing cystoid macular edema. There are 2 types of macular tel-

angiectasia. Aneurysmal (type-1) telangiectasia is believed to be a form of Coats' disease that is found in the macula. Lipid deposition is common. In perifoveal (type-2) telangiectasia, there is diffuse intraretinal leakage from the telangiectatic vessels but no prominent aneurysms.

Methods or Study Design: Case report.

Results: A 62-year-old male patient having diagnosis of diabetes mellitus for at least 20-years was referred for decreased vision and persistent diabetic macular edema in his left eye. The left eye was previously treated with two intravitreal anti-VEGF injections. Best-corrected visual acuity (BCVA) was 10/10 OD and 6/10 OS. Slit-lamp examination and intraocular pressures were within normal limits in both eyes. Dilated fundus examination showed multiple microaneurysms OU and shallow elevation of the fovea with a large macroaneurysm OS. Optical coherence tomography (OCT) findings in the right eye were normal. OCT of the left eye revealed hyporeflective cystoid spaces causing blunting of the foveal contour, and slightly inferior foveal OCT section showed large intraretinal aneurysm with a shadowing effect. Central foveal thickness was 240 µm OD and 323 µm OS.

During the follow-up of 26-months 4 additional intravitreal anti-VEGF and 1 intravitreal dexamethasone implant were injected and focal argon laser photocoagulation was performed due to persistent macular edema. At final examination BCVA in the left eye was 3/10. On dilated fundus examination the large microaneurysm was replaced with parafoveal pigment clumping. OCT showed outer retinal atrophy with an atrophic cystoid space. Fluorescein angiogram revealed multiple microaneurysms in both eyes. These findings were evaluated as macular telangiectasia in the left eye and nonproliferative diabetic retinopathy in both eyes.

Conclusions: Macular telangiectasia is a rare maculopathy that is poorly understood and often misdiagnosed.

Acknowledgements: The authors have no conflict of interest.

Keywords: Idiopathic Macular Telangiectasia, Diabetic Macular Edema, Fluorescein Angiography, Optical Coherence Tomography.

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Hereditary Retinal Dystrophy with Extensive Shallow Neurosensorial Retinal Detachment, Retinoschisis and Vitelliform Lesions

Murat Karacorlu, Mumin Hocaoglu, Isil Sayman Muslubas, Serra Arf

Istanbul Retina Institute, Istanbul, Turkey

Introduction: Hereditary retinal dystrophies are a group of rare genetic disorders. Overlapping features make it a challenging job, to give a precise diagnosis.

Methods or Study Design: Case report.

Results: A 13-year-old male patient was referred for evaluation of a progressive visual loss in both eyes since four years. He gave no history of visual impairment in his family. His parents were second-degree relatives and there was a history of mental retardation in one of his brothers. He had no complaints of pain, photophobia, or night blindness. The visual acuity was 0.2 OD with a correction of +2.25 + 0.25 × 100o and 0.4 OS with a correction of +2.25 + 0.25 × 105o. Intraocular pressure was 13 mm Hg in both eyes. On ocular examination, anterior segments were unremark-

able OU. Funduscopic examination showed bilateral irregular yellow flecks located mostly in the macula and some also outside the vascular arcades. Fovea was elevated with pigment epithelial disturbance OU. Fundus autofluorescence (FAF) imaging showed hyperfluorescence of these flecks. Optical coherence tomographic scans revealed retinoschisis in the inner nuclear layer, with a shallow neurosensorial detachment, and some deposits at the hyperfluorescent flecks seen in FAF in both eyes extending outside the posterior pole. Microperimetry showed relative and absolute scotomas in the central 8 and 20 degrees in both eyes. ERG showed a normal b/a wave ratio. The Arden ratio in electro-oculogram was 1.5 in the right eye, and 1.8 in the left eye. The visual evoked potentials were normal.

Conclusions: These results could not be attributed to a certain hereditary retinal dystrophy, but a significant improvement of macular thickness was observed after treatment with topical dorzolamide without any change in the visual acuity.

Acknowledgements: The authors have no conflict of interest.

Keywords: Hereditary Retinal Dystrophy, Electrophysiology Testing, Optical Coherence Tomography.

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AntiVEGF Response in an Atypical Retinal Granuloma

Ferit Hakan Oner, Mahmut Kaya, Taylan Ozturk, Ziya Ayhan, Ali Osman Saatci

Dokuz Eylul University, Department of Ophthalmology, Izmir, Turkey

Introduction: To describe antiVEGF response in an unusual case of retinal granuloma.

Methods or Study Design: Interventional case report.

Results: In a 42 year old female with a history of blurred vision in the right eye for 15 days fundus examination showed a raised grey-white granuloma nearly one-disc diameter in size, surrounded by exudate, a fine ring of hemorrhage and serous retinal detachment. Vitreous was clear and her past medical history was unremarkable. Following a series of laboratory and imaging studies, a single dose of intravitreal ranibizumab was injected. Afterwards, within a month, the lesion and serous detachment was regressed with a complete visual restoration. In two years follow-up no recurrence was detected.

Conclusions: AntiVEGF treatment can be a relatively safer option to handle such atypical cases.

Acknowledgements: None.

Keywords: AntiVEGF, Retinal Granuloma.

Subfoveal Choroidal Thickness Change in CSC Patients with or Without the Treatment of 1/3 PDT

Xu Li, Wang Zhi Qian, Xu He

Shenyang Fourth People Hospital, Shenyang, China

Introduction: Investigate changes in subfoveal choroidal thickness (SFCT) in CSC patients with 1/3PDT (treated group, A group) and without therapy (not treated group, B group), to compare the changes of binoculus, to study the relativity between the SFCT and vision.

Methods or Study Design: The prospective consecutive case series study included 28 patients (30 eyes) with CSC, 16 eyes were treated with a single PDT (full time, 1/3 dosage, A group). The PDT is only used in chronic CSC patients (three months after CSC). Subfoveal choroidal thickness was measured using enhance depth imaging optical coherence tomography, binocularly, at the first time, one month later, three months later and six months later respectively. The SFCT in B group is also measured. The vision is recorded at same time.

Results: Results The mean total follow-up time was 6 ± 1.5 months. The SFCT in both groups are $450 \pm 23 \mu\text{m}$ and $421 \pm 31 \mu\text{m}$ respectively at first time. In the treated eyes, the SFCT decreased significantly at 1 months after treated ($376 \pm 72 \mu\text{m}$, $p < 0.05$), 3 months later ($351 \pm 20 \mu\text{m}$, $p < 0.05$), 6 months later ($340 \pm 39 \mu\text{m}$, $p < 0.01$). In not treated patients, the SFCT are $419 \pm 41 \mu\text{m}$, $382 \pm 61 \mu\text{m}$, $376 \pm 98 \mu\text{m}$. Except two patients with both eyes suffered, the SFCT is markedly between two eyes ($p < 0.01$). Changes in SFCT was magically ($p = 0.14$) associated with the change in SFD. The change of SFCT at 6 months was not significantly compared with the change at 3 months ($P > 0.05$) in both groups. The changes of the SFCT was not correlated with the vision.

Conclusions: In the patients with CSC, the dilatation of the choroidal capillary vessel may be the reason of the disease followed by the damage of the RPE's function 2, The 1/3 PDT maybe better for CSC, especially in the chronic patients.

Acknowledgements: No.

Keywords: PDT, CSC, Subfoveal Choroidal thickness.

Italian Study on Retreatment Criteria with Ranibizumab, Quality of Life and Biomarkers in Myopic CNV Patients – 1st Interim Analysis

Maria Vadalà, On Behalf of Olimpic Study

Dipartimento BioNeC, Università di Palermo, Palermo, Italy

Introduction: The study investigates the national criteria driving retreatment with ranibizumab in patients with myopic CNV (mCNV). The study will generate safety and tolerability data, as well as evidences regarding health economics, resource consumption and patient reported outcomes (PROs) specific to the Italian population.

Methods or Study Design: The study enrolled 200 patients (range 22–83 years) from 39 Italian centers, affected by visual im-

pairment due to mCNV (high myopia $> -6\text{D}$; 24–78 ETDRS score; signs of activity at FAG/OCT). Patients received one ranibizumab injection at treatment initiation and were retreated when disease activity recurred. Data derive from an interim analysis on the first 50 patients (25% of total study population) reaching 3 months FU.

Results: Mostly patients were Caucasian (98%), female (86%), aged < 65 years (62%). PM was mostly bilateral (78%), mCNV predominantly subfoveal (56%) and unilateral (92%). After 3 months FU, mean BCVA improved by 10.7 letters with 32.7% of patients gaining ≥ 10 letters; Central Subfield Thickness reduced by $41.56 \mu\text{m}$, Central Subfield Volume reduced by 0.03 mm^3 ; with respect to baseline, fewer patients had subretinal fluid (12% vs 54%), intraretinal fluid (32% vs 78%), intra-retinal cysts (14% vs 44%), macular edema (28% vs 64%) or active leakage (45.5% vs 95.7%). The majority of patients (72%) need one or two treatments in 3 months FU (38% and 34%, respectively). The analysis suggests that retreatment decisions during the initial 3 months were mainly based on active leakage on FAG. No new safety signals were identified. Upcoming analyses will describe health economic and burden of disease data.

Conclusions: Results from this interim analysis confirm the role of ranibizumab in the treatment of myopic CNV, and suggest that the active leakage on FAG preferentially drives retreatment during the initial 3 months. Ranibizumab efficacy is confirmed, with a low number of injections.

Acknowledgements: To all the participants to the Study.

Keywords: Myopic CNV, Ranibizumab, Quality of Life, Biomarkers, Criteria Driving Retreatment.

Purtscher-Like Retinopathy as the First Sign of Thrombotic Thrombocytopenic Purpura

Susanna Catalano¹, Vito Fenicia², Sara Verrilli², Stefania Abbruzzese¹, Santi Maria Recupero²

¹ASL RM A Presidio Territoriale Nuovo Regina Margherita, Rome, Italy; ²University of Rome, Rome, Italy

Introduction: Description of a case of idiopathic thrombotic purpura with eye involvement as the first sign of the disease. Thrombotic thrombocytopenic purpura (TTP) is a rare blood disorder characterized by clotting in small blood vessels of the body, resulting in a low platelet count. In its classic form, the disease consists of the pentad of microangiopathic hemolytic anemia, thrombocytopenic purpura, neurologic abnormalities, fever and renal disease.

Methods or Study Design: A 25-year-old woman came to our observation complaining of visual decrease in both eyes from about three days. She referred a positive history for epilepsy. Visual acuity, tonometry, fundus examination were performed. A general examination including blood samples was done.

Results: Visual acuity was motu manu in the right eye and 2/100 in the left eye, fundus examination was suggestive for a purtscher-like retinopathy and consequently a fluorescein angiography and optical coherence tomography (OCT) were carried out. The OCT showed a reduction of ganglion cell complex thickness (GCC) and an alteration of the IS/OS junction. The hematologic exams revealed thrombocytopenia, presence of schistocytes (1–

2%) and linfoplasmacitoid elements suggestive for severe emolitic anemia. During the controls she had an hypertensive crisis with kidneys failure, as a consequence she was recovered in the intensive care Unit and a support therapy with corticosteroids and antiplatelet agents was established. Plasma exchange was started when the diagnosis of TTP was done.

Conclusions: The exact etiology of TTP is unknown. The majority of sporadic cases of TTP appears to be connected to severe deficiency of ADAMTS13 activity due to autoantibodies against this protease. Measuring ADAMTS13 activity level may help in diagnosis. This is an interesting case in which the ocular involvement was the warning sign that stimulate further examinations showing a severe hematologic disease.

Acknowledgements: We thank profusely the Staff of the cardiologic intensive care unit S.Andrea hospital.

Keywords: Purtscher-Like Retinopathy, Thrombotic Thrombocytopenic Purpura, ADAMTS13.

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Long Term Results of Anti-VEGF Treatment in a Case with Bilateral Optic Nerve Head Coloboma and Choroidal Neovascular Membrane

Hurkan Kerimoglu, Gunhal Satirtav

NEU Meram Faculty of Medicine, Konya, Turkey

Introduction: Choroidal neovascular membrane (CNVM) is a well-documented complication of retinochoroidal colobomas. It is suggested that disruption of Bruch's membrane at the margin of the coloboma provides a space into which choroidal vessels can proliferate. The natural history of CNVM ranges from spontaneous resolution to severe visual loss. We report the long term results of anti-VEGF treatment in a unique case with bilateral optic nerve head coloboma and CNVM.

Methods or Study Design: Case Report.

A 32-year-old healthy woman was first presented in April 2012 with a chief complaint of progressive bilateral visual loss which was pronounced in the left eye. Her best corrected visual acuity was 0.5 in the right and 0.2 in the left eye. The diagnosis of bilateral coloboma was made by characteristic optic nerve head appearance. The presence of bilateral CNVM was observed and subsequently confirmed using fluorescein angiography and optical coherence tomography.

Results: The patient received 9 ranibizumab injections to her left eye and 3 ranibizumab injections to her right eye during the 3 years follow up. The visual acuity improved to 0.8 in both eyes. During the follow up optical tomography revealed resolution of intraretinal fluid and choroidal neovascular membrane regressed, leaving fibrotic scars in both eyes.

Conclusions: Intravitreal ranibizumab is an efficacious and safe treatment in the management of choroidal neovascularization associated with optic nerve coloboma.

Acknowledgements: No relevant financial relationship exist.

Authors thank to medical staff of the clinic for technical assistance.

Keywords: Optic Nerve Head Coloboma, Choroidal Neovascular Membrane, Anti-VEGF.

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CNV in the Elderly Patients with High Myopia: Response to Intravitreal Bevacizumab (IVB)

Maria Isabel Lopez, Rosalba Ramoa, Felix Manco, Jose Ignacio Alonso, Lucia Manzananas

Hospital Clinico Universitario, Valladolid, Valladolid, Spain

Introduction: Choroidal neovascularization is the main cause of vision loss in patients with high myopia. It's prognosis has changed with anti-VEGF drugs. However, results are conditioned by the size of the lesion and the age of the patient.

The purpose of this study was to evaluate the safety and efficacy of IVB in the treatment of high myopic choroidal neovascularization (MCNV) in patients over 60 years of age in clinical practice.

Methods or Study Design: We retrospectively reviewed the ophthalmic records of all the myopic eyes with MCNV treated with IVB with a PRN regimen and 12 months of follow-up. Only patients older than 60 years of age and with a complete baseline ophthalmologic examination, including the best-corrected visual acuity (BCVA), fundus examination, fluorescein angiography and optical coherence tomography were included. Patients with structural damage in the fovea and no possibility of functional gains were excluded. The general clinical records were also reviewed for systemic side effects.

Results: 24 eyes of 24 patients were evaluated 18 women with a mean age 65.06 years and 6 men with mean age 68.16 years. Only 17 had the complete ophthalmic examination at the 12 month visit. 4 patients gained more than 10 letters at twelve months. 9 remained stable and 4 had lost at least 5 letters. 10 eyes were classified as category 3, 5 with patchy atrophy, all with plus lesions.

The mean number of injections was 3.04. Regarding safety two patients were diagnosed of angor pectoris during treatment (at 7 and 30 days after the injection). Both patients had been previously diagnosed of cardiovascular disease.

Conclusions: The results of this study show that IVB is useful in MCNV but functional outcomes in patients over 60 years of age with evolutioned degrees of maculopathy are poor and visual gains are rare. Further studies in this population are needed.

Acknowledgements: This work was done in part with a grant from Novartis.

Keywords: CNV, Myopia, Pachy Atrophy, Safety.

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Interim Results from the Ocriplasmin for Vitreomacular Traction Intravitreal Injection Decisions (OVIID-I) Trial

Jordi Monés

Institut de la Macula i de la Retina, Barcelona, Barcelona, Spain

Introduction: OVIID-I is a phase IV trial designed to observe the anatomical and functional outcomes of ocriplasmin injection in vitreomacular traction (VMT)/symptomatic vitreomacular adhesion (sVMA) patients with focal VMT and absence of epiretinal

membrane; two baseline characteristics suggested to be positively associated with nonsurgical VMA/VMT resolution.

Methods or Study Design: OVIID-I is a multicenter, prospective, single-arm study of a single intravitreal injection of 125 µg ocriplasmin for patients with VMT/sVMA. Pertinent exclusion criteria include epiretinal membrane over the central macula, baseline VMA/VMT >1500 microns, or baseline macular hole >400 microns. The primary efficacy end point is the proportion of patients with nonsurgical VMT/sVMA resolution at Day 28 by central reading center spectral domain optical coherence tomography evaluation.

Results: The interim analysis included 319 patients. Among patients with focal VMT (≤ 1.500 microns) at baseline, 42.7% (95% CI 35.7% to 49.9%) achieved nonsurgical resolution of VMT/sVMA at Day 28. Resolution of VMT by Day 7 occurred in 37.0% of patients (95% CI 30.3–44.1%). Reported serious ocular adverse events include macular hole (0.6%, $n = 2/319$), visual acuity reduction (0.6% $n = 2/319$), and retinal detachment (0.3%, $n = 1/319$).

Conclusions: The interim results suggest that the efficacy of ocriplasmin for VMT/sVMA can be enhanced by selection of patients with focal VMT and absence of epiretinal membrane. Results from the OVIID-I study will contribute to the further characterization of ocriplasmin efficacy and safety profile.

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Keywords: Ocriplasmin, Symptomatic Vitreomacular Adhesion (VMA), Vitreomacular Traction (VMT), Nonsurgical VMA/VMT Resolution.

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Sickle Cell Retinopathy: 2 Case-Reports

Ana Cabugueira, Bárbara Borges, Vanessa Lemos, Lívio Costa, Margarida Marques, Rita Flores

Centro Hospitalar Lisboa Central, Lisboa, Portugal

Introduction: Sickle cell hemoglobinopathies result from an abnormality in the beta chain of the hemoglobin molecule. Patients with sickle cell disease are susceptible to develop peripheral retinal neovascularization, also called sea-fans, vitreous hemorrhage and retinal detachments, which are the main causes of vision loss.

The authors aimed to describe two cases of sickle cell retinopathy with different therapeutic approaches. Hemoglobinopathies are a group of inherited disorders characterized by quantitative or qualitative malformations of hemoglobin.

Methods or Study Design: The authors present two cases of sickle cell retinopathy with different therapeutic approaches. Visual acuity, intraocular pressure, biomicroscopy, funduscopy, retinography, angiography and optical coherence tomography were performed.

Results: A 39 years old men, with sickle cell disease, SC genotype and history of miodesopsias in the left eye (LE). On examination he was 20/20 of visual acuity and a stage III C in the right eye (RE) and stage IV of retinopathy in LE on funduscopy/angi-

ography. Peripheral retinal scatter photocoagulation was performed.

A 22 years old woman, without any ophthalmologic symptoms was 20/20 visual acuity. On funduscopy/angiography, she was a retinopathy sickle cell, stage I/II in RE and stage III C in LE. We decided to follow up the natural course of the disease without photocoagulation.

Conclusions: The most important feature of this disease is sickle cell retinopathy, which presents a wide spectrum of manifestation and requires follow-up of the progression or regression of lesions, and consequently choose the best therapeutic of the options available.

Acknowledgements: Centro Hospitalar Lisboa Central.

Keywords: Sickle Cell Retinopathy, Natural Course, Photocoagulation.

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Cherry Red Spot: A Presenting Sign of Sialidosis

Ana Cabugueira, Bárbara Borges, Ana Basílio, Nuno Silva, Rita Anjos, Rita Flores

Centro Hospitalar Lisboa Central, Lisboa, Portugal

Introduction: To describe ophthalmologic findings in a clinical case of sialidosis also Known as Mucopolipidosis type I. It is a rare inherited lysosomal storage disease with wide spectrum of variability in disease manifestation, but cherry-red spots appear with age in most patients.

Methods or Study Design: The authors report the case of 27 years old male with painless and progressive bilateral decreased visual. Visual acuity, biomicroscopy, funduscopy, retinography, fluorescein angiography, Spectral-Domain Optical Coherence Tomography (OCT) and laboratory study were performed.

Results: Best corrected visual acuity was 3/10 on right eye was and on left eye was 8/10. Slip lamp examination was deep and quite. Funduscopy showed bilateral macular cherry. Fluorescein angiography demonstrated hipofluorescence in the foveal area and OCT revealed increased hiperreflectivity of retinal layers. Laboratory tests were performed and confirmed the diagnosis of sialidosis. Neurological symptoms were denied. In the last ophthalmologic observation the patient was 60 years old, visual acuity was 2/10 in both eyes and fundus examination was similar.

Conclusions: A careful clinical research is required in the presence of macular cherry spot on funduscopy. Sialidosis is a rare disease that should be included in the differential diagnostic of macular red spot without suspicious of arterial occlusion.

Acknowledgements: Centro Hospitalar Lisboa Central.

Inflammatory Choroidal Neovascularization: Visual and Anatomical Results of Treatment with Anti-VEGF Agents

Ana Cabugueira, Bárbara Borges, Bruno Carvalho, Manuel Noronha, Miguel Marques, Rita Flores

Centro Hospitalar Lisboa Central, Lisboa, Portugal

Introduction: Choroidal neovascularization (CNV) is a documented complication of uveitis. Despite being rare, it is an important cause of loss of vision in these patients. Therapeutic options include, in addition to treatment directed to inflammatory disease, LASER photocoagulation, photodynamic therapy with verteporfin (PDT) and, more recently, antivascular endothelial growth factor (VEGF) drugs. The authors aimed to evaluate a series of 7 cases of inflammatory CNV treated with anti-VEGF agents.

Methods or Study Design: The authors describe a series of 7 cases (7 eyes) of inflammatory CNV treated with anti-VEGF agents. The following parameters were evaluated: uveitis etiology, CNV location, visual acuity changes and central macular thickness (CMT) after intravitreal injection (IV) of anti-VEGF drugs.

Results: In our series, 2 patients presented with multifocal chorioiditis, 2 patients with toxoplasmosis, 2 patients with punctate inner choroidopathy and 1 with Vogt-kyonagi-Harada syndrome. Only 1 patient presented with extrafoveal CNV (justapapilar), 4 presented with juxtafoveal CNV and 2 with subfoveal CNV. Three patients were treated with ranibizumab and 4 patients were treated with bevacizumab, with an average of 3 IV on both groups. Visual acuity improved in 6 cases. There was a decrease of CMT in all patients.

Conclusions: CNV is a serious complication of inflammatory diseases, for which there are no treatment guidelines. Although our sample is small, the results seem to show a good outcome in patients treated with anti-VEGF IV, suggesting that this is an important therapeutic option. We emphasize the importance of multicenter, randomized and controlled studies to validate this therapeutic option.

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An Atypical Case of Ocular Tuberculosis

Bárbara Borges, Ana Cabugueira, Ana Luísa Basílio, Vitor Maduro, Isabel Domingues, Rita Flores

Centro Hospitalar Lisboa Central, Lisboa, Portugal

Introduction: Tuberculosis (TB) is an infection caused by *Mycobacterium tuberculosis* that affect many organs, including the eye. Ocular TB can involve any part of the eye and can occur with or without evidence of systemic TB. The authors describe a case of an ocular lesion as a presenting sign of tuberculosis.

Methods or Study Design: Visual acuity, intraocular pressure, biomicroscopy, funduscopy, retinography, fluorescein and indocyanine green angiography and optical coherence tomography (OCT), laboratory study, computed tomography scan, chest x-ray were performed and evaluated.

Results: A 68 years old man presented with painless decreased visual acuity of right eye (RE) with one week of evolution. Best corrected visual acuity (BCVA) in the RE was 5/10 and in left eye was 10/10. Slit-lamp examination showed a deep, quiet anterior chamber. Fundoscopy showed a papillomacular lesion in the RE and the LE did not show significative alterations. OCT revealed presence of fluid with 482 µm of retinal macular thickness (RMT). Fluorescein angiography (FA) confirmed an active hyperfluorescent lesion in the papillomacular bundle of RE. Infectious and inflammatory etiologies were investigated and Mantoux test was positive. Cranial computerized tomography scan and chest x-ray did not show significative alterations.

Systemic therapeutic (isoniazid, pyrazinamide, rifampin and ethambutol) was started immediately. During the treatment, BCVA RE improved to 10/10 and funduscopy, FA and OCT showed a cicatricial lesion in the papillomacular bundle and 106 µm of RMT.

Conclusions: Tuberculosis displays a wide array of clinical manifestation and therefore the diagnosis can be challenging. It requires a high degree of clinical suspicion and other diseases, that might have similar appearance, should be excluded.

Acknowledgements: Centro Hospitalar Lisboa Central, Lisboa, Portugal.

Keywords: Tuberculosis, Granuloma, Uveitis.

Transneuronal Retrograde Degeneration of the Retinal Ganglion Cells in Patients with Cerebral Infarction

Ali Atakhan Yildiz¹, Aysegul Mavi Yildiz², Ayse Zeynep Acar³, Ali Olgun³, Dilek Guven³

¹Kelkit State Hospital, Gümüşhane, Turkey; ²Gümüşhane State Hospital, Gümüşhane, Turkey; ³Sisli Hamidiye Etfal Training and Research Hospital, Istanbul, Turkey

Introduction: The purpose of this study was to investigate the probable transneuronal retrograde degeneration (TRD) of the retinal ganglion cells (RGC) in humans with cerebral infarction. In addition the correlation between the laterality and severity of retinal nerve fiber layer (RNFL) damage and other variables; laterality of hemispheric damage, arterial territory of infarct were analyzed.

Methods or Study Design: The records of 30 patients with cerebral ischemic infarction diagnosed based on brain magnetic resonance imaging were included. The average follow up time was 12 months. All subjects underwent a complete ophthalmic examination including optical coherence tomography (OCT) and perimetry. Cerebral infarction was categorized by arterial territory: anterior cerebral artery (ACA), middle cerebral artery (MCA), and posterior cerebral artery (PCA). Eyes on the same side of the infarction were referred to as ipsilateral eyes, and eyes on the opposite side of the infarction were referred as contralateral eyes. The main outcome measures were thicknesses of retinal nerve fiber layer ganglion cell complex, visual field loss.

Results: The RNFL thicknesses were reduced significantly at the superior, inferior, temporal and nasal quadrants in the contralateral eyes and at the superior, inferior, and temporal quadrants

in the ipsilateral eyes. The RNFL thickness reduction was statistically similar between groups of PCA, MCA and ACA infarction. The reduction of RGC thickness wasn't statistically significant for both ipsilateral and contralateral groups ($p > 0.05$). The loss of visual field was statistically significant in the contralateral group ($p = 0.001$) unlike the ipsilateral group.

Conclusions: Retinal nerve fiber layer thickness was reduced in patients with cerebral infarction, providing evidence for TRD of the RGC. Transneuronal retrograde degeneration was more pronounced in the nasal nerve fiber layer of the contralateral side and in the temporal nerve fiber layer of the ipsilateral side of cerebral damage.

Acknowledgements: Conflicts of Interest: Yildiz AA, None; Mavi Yildiz A, None; Acar ZA, None; Olgun A, None; Guven D, None.

Keywords: Transneuronal Retrograde Degeneration, Cerebral Infarct, Optic Nerve.

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Indocyanine Green Angiography Characteristics in Polypoidal Choroidal Vasculopathy and Treatment Strategies

Ozge Yanik, Sibel Demirel, Figen Sermet, Emin Ozmert

Ankara University Faculty of Medicine, Department of Ophthalmology, Ankara, Turkey

Introduction: The aim of the study is to evaluate the clinical findings, indocyanine green angiography (ICGA) characteristics and treatment modalities in polypoidal choroidal vasculopathy (PCV).

Methods or Study Design: Eighteen eyes of 16 consecutive patients with PCV were evaluated retrospectively in the study. Characteristic ICGA findings including localization and number of the polypoidal lesions and the type of lesion due to presence or absence of the draining or feeding vessels were evaluated.

Results: The mean age of the patients at the time of diagnosis was 6.8 ± 9.8 (48–84) years. The feeding and draining vessels were identified in 8 eyes (Type 1). Nine eyes had neither feeder nor draining vessels, only polypoidal structures and branching network were seen (Type 2). In one eye, the type of the lesion could not be identified due to subretinal hemorrhage. The localization of the polypoidal lesions were juxtapapillary in 7 eyes, macular in 5 eyes, extrafoveal in 5 eyes, and papillomacular in 1 eye. All of the type 1 lesions had multiple polypoidal structures. Of the 9 type 2 lesions, single polypoidal lesion was identified in 5 eyes (55.5%). The mean follow up period was 19.2 (1–101) months. Spontaneous regression of the polyps was observed in 2 eyes (11.1%). Photodynamic therapy was applied in 7 eyes (38.8%). Thermal laser photocoagulation was applied in 1 eye (5.5%). Eleven eyes (61.1%) underwent an average of 4.9 (1–19) intravitreal anti-VEGF injections. At the end of the follow-up period, the mean visual acuity changed from 0.46 ± 0.33 logMAR to 0.43 ± 0.44 logMAR ($p = 0.317$).

Conclusions: The results of the study support the presence of two different types of lesions in PCV according to ICGA findings. In accordance with the different characteristics of polypoidal le-

sions, different treatment strategies may be considered in the PCV management.

Acknowledgements: None of the authors have any proprietary interests or conflicts of interest related to this submission. None of the authors have any financial support.

Keywords: Polypoidal Choroidal Vasculopathy, Indocyanine Green Angiography, Photodynamic Therapy, Intravitreal Anti-VEGF Injection.

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Large Pigment Epithelium Detachment – A Case Report

Bárbara Borges, Ana Cabugueira, Manuel Noronha, Rita Anjos, Ana Amaral, Rita Flores

Centro Hospitalar Lisboa Central, Lisboa, Portugal

Introduction: With the emergence of antiangiogenic therapies, photodynamic therapy (PDT) has been used less frequently. However, it remains useful in particular situations. The authors describe a case that shows the importance of PDT in the treatment of polypoidal choroidal vasculopathy.

Methods or Study Design: Visual acuity, intraocular pressure, biomicroscopy, fundoscopy, retinography, fluorescein angiography and optical coherence tomography were performed.

Results: A 74 years old man presented with left eye (LE) painless decreased vision. Best corrected visual acuity (BCVA) in the right eye (RE) was 1.0 and in the LE was 0.5 with metamorphopsia. These complaints had began 3 months before and the patient had been treated with 3 intravitreal injections of antivascular endothelial growth factor with no improvement. Fundus examination showed a large pigment epithelial detachment in the RE and soft drusens in both eyes. Fluorescein and indocyanine green angiography revealed retinal hyperfluorescent spot in papillomacular bundle. After PDT, BCVA improved to 0.9 with no fluid in the macula.

Conclusions: This case illustrates the importance of PDT in clinical practice. Besides being a therapeutic option for patients with systemic or ocular contraindications regarding intravitreal administration of antiangiogenic drugs or as an adjuvant, in combination with other drugs, PDT is indicated in cases of polypoidal choroidal vasculopathy.

Acknowledgements: Centro Hospitalar Lisboa Central.

Keywords: Photodynamic Therapy, Polypoidal Choroidal Vasculopathy, Pigment Epithelium Detachment.

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Eales' Disease – A Diagnostic Challenge

Ana Luísa Basílio, Bárbara Borges, Ana Cabugueira, Vanessa Lemos, Nuno Silva, Ana Amaro, Rita Flores

Centro Hospitalar de Lisboa Central, Lisboa, Portugal

Introduction: Eales' disease is characterized by an obliterative vasculopathy of the peripheral retina. It's a rare condition, which prevalence is greater in Indian people and among young males.

Diagnosis is based on clinical presentation, requiring the exhaustive exclusion of other ocular and systemic pathologies. An association between Eales' disease and hypersensitivity to tuberculin has been proposed although the etiology is apparently multifactorial. When all the laboratorial results are negative, the disease is recently being named as idiopathic occlusive vasculitis.

Methods or Study Design: The authors report the case of a 65 year-old caucasian woman, previously healthy, that came to the emergency room with complaints of sudden vision loss of the left eye. A complete ophthalmologic evaluation and complementary exams were performed, namely fundus photography, wide-field fluorescein angiogram, Spectral-Domain Optical Coherence Tomography (OCT) and laboratory study.

Results: Best corrected visual acuity was 20/20 on right eye and 20/50 on left eye. Fundus examination revealed a vitreous hemorrhage with an inferior preretinal hemorrhage, which reabsorbed spontaneously in the following weeks. Subsequent examinations demonstrated peripheral bilateral neovascularization compatible with peripheral occlusive disease and a segmental scatter photocoagulation of the involved quadrants of the retina was adopted. The exclusion of other systemic or ocular conditions that could present with similar retinal features has permitted to diagnose Eales' disease. Fundus photography and wide-field fluorescein angiogram documented the lesions. Although the vitreous hemorrhage reappeared twice in the first year, the retina has been stable for twenty months, the neovascular lesions are in regression and all ischemic regions are photocoagulated.

Conclusions: The reported case is uncommon, concerning patient's gender, age and race. In spite of recurrent vitreous hemorrhage being a common presentation of Eales' disease, its early diagnosis and prompt management is preponderant. Photocoagulation is the mainstay of treatment in proliferative stages.

Acknowledgements: Centro Hospitalar Lisboa Central.

Keywords: Eales' Disease, Vitreous Hemorrhage.

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Terson's Syndrome: The Visual Involvement of Subarachnoid Hemorrhage

Ana Luísa Basílio, Ana Cabugueira, Nuno Silva, Bárbara Borges, Ana Amaro, Teresa Gomes, Rita Flores

Centro Hospitalar de Lisboa Central, Lisboa, Portugal

Introduction: Terson's syndrome refers to the occurrence of intraocular hemorrhage subsequent to subarachnoid hemorrhage (SAH), usually due to a ruptured cerebral aneurysm. Its presence is associated with higher mortality in SAH.

Methods or Study Design: The authors report the case of a 32 year-old woman with sudden vision loss of the left eye. She was recently diagnosed with an acute subarachnoid hemorrhage, in the context of an anterior communicating artery ruptured aneurysm. A complete ophthalmologic evaluation and complementary exams were performed, namely fundus photography, ultrasound study and visual field test.

Results: Best corrected visual acuity was 20/20 on right eye (RE) and 'hand motion' on left eye (LE). Fundus examination revealed optic disc edema on RE and central vitreous hemorrhage on LE. Fundus photography and ultrasound study documented the

lesions. Visual field test revealed an almost total loss of field. One month later, the patient was discharged. After two months of follow-up, optic disc swelling reverted, but vitreous hemorrhage persisted.

Conclusions: A careful clinical research is required in the presence of visual complaints in SAH. Ocular involvement may be significant in those cases, namely with intraocular hemorrhage or optic disc swelling.

Acknowledgements: Centro Hospitalar de Lisboa Central.

Keywords: Terson's Syndrome, Vitreous Hemorrhage.

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Intravitreal Dexamethasone Implant (Ozurdex) Injection in Macular Edema after Retinal Surgery

Murat Kucukcilioglu, Ali Hakan Durukan, Seckin Aykas, Dorukcan Akincioglu

Gulhane Military Medical School, Department of Ophthalmology, Ankara, Turkey

Introduction: Macular edema after cataract surgery is a well-known entity. However, it is quite rare after vitreo-retinal surgery for various retinal disorders such as retinal detachment, epiretinal membrane or macular hole. We herein want to present three cases developed macular edema after retinal surgery, and managed with intravitreal dexamethasone (IV-DEX) implant injection.

Methods or Study Design: Case series with optical coherence tomography documentation.

Results: Case 1: A female patient who underwent vitrectomy with silicone oil injection for regmatogenous retinal detachment. Silicone oil was removed with cataract surgery and internal limiting membrane (ILM) peeling 4 months after the surgery. She developed cystoid macular edema 4 months later. She received anti-VEGF injections which showed no improvement. Then IV-DEX was injected which resulted in complete resolution of macular edema and visual improvement.

Case 2: A male patient who underwent vitrectomy with internal limiting membrane peeling and SF6 gas injection for full-thickness macular hole. He developed macular edema 2 months after the surgery. Topical steroid and then acetazolamide eye drops, and 1 anti-VEGF injection showed no change. Lastly he received IV-DEX after which all intraretinal cysts were gone and there was three lines increase in the visual acuity.

Case 3: A male patient who underwent vitrectomy with membrane/ILM peeling. He developed macular edema 3 months after the surgery, which showed no improvement after topical and subtenon steroid, and anti-VEGF injection therapies. IV-DEX injection was performed which resulted in complete resolution of macular edema.

No injection related complication or pressure increase was noted during the follow-up.

Conclusions: Macular edema may be seen even a couple of months after retinal surgery. IV-DEX injection may be considered as a treatment option in such cases.

Acknowledgements: None.

Keywords: Intravitreal Dexamethasone Implant, Macular Edema, Retinal Surgery.

Intra-Vitreous Injection of Ranibizumab for Chronic Central Serous Chorioretinopathy (CCSR)

Amr Abdel-Fattah Gab-Alla

Faculty of Medicine, Suez Canal University, Ismailia, Egypt

Introduction: To evaluate the efficacy of intravitreal injection of ranibizumab for patients with chronic central serous chorioretinopathy.

Methods or Study Design: A prospective interventional series non-comparative study of 9 patients with chronic central serous chorio-retinopathy who were treated with intra-vitreous injection of ranibizumab once. Visual acuity with Snellen's chart and the foveal thickness, before and after the injection were studied.

Results: Mean age of the patients was 44.3 ± 5.7 years. After one month of intra-vitreous injection, visual acuity improved from 20/120 to 20/30 ($p < 0.001$). Central retinal thickness (CRT) improved from $493 \pm 76 \mu\text{m}$ (pre-injection) to $216 \pm 36 \mu\text{m}$ (one month after injection) ($p < 0.001$). None of the cases exhibited relapses.

Conclusions: Intra-vitreous injection of ranibizumab can be an optional treatment in patients with chronic serous central chorioretinopathy as it leads to an anatomic and functional improvement.

Acknowledgements: To my family.

Keywords: Ranibizumab, Ranibizumab, Central Serous Chorioretinopathy, Intra-Vitreous Injection, Central Retinal Thickness.

Simultaneous Phacoemulsification and Anti-VEGF Therapy

Igor Ioshin, Anna Tolchinskiy, Aina Ozderbaeva

Federal State Institution, Moscow, Russia

Introduction: To present the results of treatment of patients with cataracts and neovascular form of age-related macular degeneration (AMD), based on a combination of phacoemulsification and the first Ranibizumab IVT.

Methods or Study Design: 28 patients were operated. The average age of the patients – 77.2 years (range 67 to 84). The average visual acuity before surgery – 0.1 20/100 (20/200 to 20/70). The average thickness of the retina by OCT – before the operation $370 \pm 32 \mu\text{m}$ (from 358 to 435 microns).

Phacoemulsification was performed by standard techniques. In the final stages of the phacoemulsification before to wash out viscoelastic was performed Ranibizumab IVT.

The next Ranibizumab IVT's were performed at a monthly check up after appropriate testing visual acuity and taking into account the dynamics of retinal thickness.

Results: VA after surgery improved in all patients. The maximum VA after operations was – 20/40 on average – 20/50. Limitation of the visual result is associated with concomitant AMD. However, all patients expressed satisfaction with their quality of

life. Subsequently, during the process, in the anti-VEGF therapy visual acuity to 20/30 is further improved and the thickness of the retina has decreased in average to 246 ± 23 microns.

Conclusions: This combined procedure does not introduce additional difficulties for the two technologies, does not lead to additional complication, obviously speeds up the process of rehabilitation of patients with cataracts and AMD.

First injection was the beginning of a consistent anti-VEGF treatment of neovascular AMD. Patients agreed for the next injection more easily, at a favorable emotional background, patients consistently formed a commitment to the duration of treatment.

Acknowledgements: The outcome of the first injection has definitely influenced an optical rehabilitation, and that gave rise to a greater motivation of patients than in the general group of patients with AMD.

Choroidal Neovascularisation in Keratoconus Patient: A Case of Dual Pathology

Minji Jennifer Kim, Robert Tootell, Jeff Kwartz, Simon Kelly

Royal Bolton Hospital, Bolton, United Kingdom

Introduction: Myopic choroidal neovascularisation (CNV) is a condition associated with pathological myopia. We report an unusual case of a 37-year-old patient with keratoconus attending the corneal clinic with reduced vision secondary to myopic choroidal neovascularisation. There is a noteworthy paucity of reports in the literature regarding the co-existence of these two vision-threatening conditions.

Methods or Study Design: The patient had a background of cerebral palsy and was a regular attendee of the corneal and contact lens clinic for several years, successfully managed with rigid gas permeable lenses. He had noticed a reduction in vision in his right eye associated with distortion and was reviewed in the corneal clinic.

Results: The patient's vision had reduced from 0.36 logMAR to 0.78 logMAR and no anterior segment disease progression could be attributed to the patient's recently increased symptoms. Dilated funduscopy revealed myopic fundi with lacquer cracks and a Foster Fuch's haemorrhage at the right macula, at which point he was referred to the retinal services. Optical coherence tomography (OCT) revealed intraretinal fluid and urgent fluorescein angiography confirmed the diagnosis of choroidal neovascularisation. He underwent two intravitreal injections with Ranibizumab and his vision has improved and is maintained at 0.42 logMAR, three months after his final injection. Repeat OCT imaging confirms that there has been no recurrence in intraretinal or subretinal fluid.

Conclusions: It is of great importance that clinicians are aware that a deterioration of vision in keratoconic patients may not be due to corneal disease progression alone and therefore one must be vigilant to the possibility of dual pathology. Detailed, dilated fundal examination with the use of optical coherence tomography should be advocated in such patients to ensure that readily treatable, time-sensitive pathology is not missed to the detriment of the patient.

Acknowledgements: None.

Keywords: Keratoconus, Choroidal Neovascularisation, Myopia.

Optic Pit Closure with Autologous Internal Limiting Membrane

Dorukan Akincioglu, Murat Küçükcilioglu, Ali Hakan Durukan
Gülhane Military Medical Academy, Ankara, Turkey

Introduction: Optic disc pit is a rare closure defect in lamina cribrosa. Optic pit is approximately one in 11,000 people. Affected population mostly present with deteriorated vision due to serous macular detachment with or without macular schisis. The ideal technique for reattachment of macula in optic pit related cases is to stop flow through this defect. Laser photocoagulation and pars plan vitrectomy with endotamponade are widely accepted management options even though unfavorable results are not rare. We aim to present a case with serous macular detachment due to optic disc pit which is sealed by autologous internal limiting membrane.

Methods or Study Design: A 25 year-old male presented with decreased vision in his left eye. Best corrected visual acuity was 0.48 (LogMAR) and his complete ophthalmic examination revealed left optic disc pit with serous macular detachment. Krypton laser photocoagulation treatment to the temporal margin of optic disc was first choice of treatment. Two weeks later follow-up examination revealed no improvement in macular detachment though narrowed passage with laser photocoagulation scars was seen. Pars plana vitrectomy was performed along-with ILM peeling with endolaser photocoagulation and air-SF6 (%30) gas exchange and postoperative prone positioning. One month later macula was nearly reattached and his best corrected visual acuity was 0.30 (LogMAR). In his last follow-up examination three month after operation his best corrected visual acuity was 0.18 (LogMAR) and anatomical result was satisfactory.

Results: This novel technique is quite logical with its favorable results. In pars plan vitrectomy cases without sealing passage subretinal migration of endotamponade is another undesirable result. However occlusion of passage with internal limiting membrane is thought to hinder this unwelcoming result.

Conclusions: Laser photocoagulation may seem harmless, nevertheless paracentral scotoma and low success rates are common problems. Pars plana vitrectomy with autologous internal limiting membrane results are promising in good hands though large clinical trials should be conducted.

Acknowledgements: I am grateful for helpful discussions about the manuscript.

Keywords: ILM, Macular Detachment, Optic, Pit.

Electrophysiologic Follow-Up in Idiopathic Neovascular Membrane Treated with Monthly Ranibizumab Injections

Dorukan Akincioglu, Murat Kucukcilioglu, Ali Hakan Durukan
Gülhane Military Medical Academy, Ankara, Turkey

Introduction: Severe visual impairment is commonly caused by age-related macular degeneration in developed countries which %90 of visual loss is related to neovascular form seen in %20 of

AMD patients. Choroidal neovascular membrane commonly develop secondary to predisposing factors like pathological myopia, angioid streak, trauma or inflammation. However no predisposing causes can be detected in a significant number of young patients presenting with choroidal neovascularisation which is termed idiopathic choroidal neovascular membrane. Due to pivotal role of vascular endothelial growth factor in pathogenesis of neovascular age-related macular degeneration, ranibizumab is a first-line therapy with good short-term results. We present a case of idiopathic membrane followed by multifocal electroretinography, visual field and optical coherence tomography.

Methods or Study Design: A young female patient diagnosed with idiopathic choroidal neovascular membrane administered monthly ranibizumab injections followed by multifocal electroretinogram and visual field testing.

Results: A 25-year-old female pilot candidate was referred for evaluation of decreased vision revealed during her routine check-up examination. There was no history of systemic disease or trauma. Best corrected visual acuity was 0.78 (LogMAR) in her left eye, anterior segment and vitreous was completely normal. Fundoscopic examination revealed macular degeneration. Examination of right eye was not remarkable. Optical coherence tomography and funds fluorescein angiography findings were confirming with minimal intraretinal fluid and well-defined hyper fluorescent area corresponding to the choroidal neovascular membrane. No inflammatory loci were seen and her complete blood work was not remarkable. She was administered three monthly intravitreal injections. Her visual acuity and multifocal electroretinogram P1 amplitudes seemed in correlation. Besides her central scotoma in her baseline visual field testing disappeared in following visual field testing examinations though reappeared in her final testing.

Conclusions: Neovascular membranes in macular region result with serious central vision loss. This prompts new strategies and valid methods to assess and monitor retinal function through the treatment period.

Acknowledgements: I am grateful for helpful advice about the manuscript.

Keywords: CNVM, Electrophysiology, Idiopathic.

A Case of Congenital Retinal Macro Vessels Anomaly That Cause Macular Degeneration

Rıza Güngör

Beytepe Military Hospital, Ophthalmology Department, Ankara, Turkey

Introduction: Congenital retinal macro vessels anomaly disease is rare. Usually, It present unilateral macular aberrant retinal vessels that is characterized by the passing from the foveal avascular area. Visual acuity is usually not affected. In our case, it is aimed to show determined signs with further investigation of congenital retinal macro vessels anomaly that caused macular degeneration and visual impairment.

Methods or Study Design: The case is a 20-year-old male patient complained with low vision in the right eye since childhood. Aberrant retinal venules were seen in funduscopy. Further inves-

tigations including fundus photo, FFA, Spectral OCT tests were done for evaluation.

Results: In local examination, fixation of both eyes and pupillary light reaction were normal. Refracting and transparent area was normal in biomicroscopy. Left eye funduscopy was normal; in the right eye funduscopy, macular macro retinal venules were seen extending vertically between the structure of the upper and lower temporal arcuate vessels. There were foveola reflection loss and macular degeneration. Both eyes were emmetrop. Right eye visual acuity was 20/200, left eye visual acuity was 20/20 level. Intraocular pressure was normal in the both eyes. In fundus fluorescein angiography (FFA), left eye was normal. In the right eye in the early phase of FFA, it was revealed retinal vein anomaly including vertical vessels progressing macular midline, showing early filling defects and no leak. In the late phase of angiography, foveolar avascular area was observed as closed with venules network. In Spectral OCT, in horizontal macular section, foveolar structure loss and macular irregularities were observed.

Conclusions: The congenital retinal macro vessels anomaly can cause macular anatomical changes resulting in macular degeneration and functional impairment.

Acknowledgements: Congenital retinal macro vessels anomaly is limited only a few cases in the literature. In our case, it is aimed to show uncharacteristic features of this anomaly that cause like macular degeneration and visual impairment.

Keywords: Retinal Macrovascular Anomaly, Macular Degeneration.

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Contralateral Dexamethasone Effect in Macular Edema in a Patient with Non-Infectious Uveitis

Murat Kucukcilioglu, Dorukcan Akincioglu, Ali Hakan Durukan

Gulhane Military Medical School, Department of Ophthalmology, Ankara, Turkey

Introduction: Contralateral effect of anti vascular endothelial growth factor injections is well known. However, there is scarce knowledge about contralateral effect of intravitreal dexamethasone implant (Ozurdex). We herein want to present a uveitis patient that showed improvement in macular edema in the other eye after unilateral Ozurdex injection.

Methods or Study Design: Case report with optical coherence tomography follow-up.

Results: A 20-year old male patient who had been followed for 12 years for posterior uveitis received Ozurdex injection in the right eye for macular edema. At that time there was cystoid macular edema in the right eye, and intraretinal cysts associated with tiny subfoveal serous detachment in the left eye. Visual acuity was 0.3 in the right eye and 0.6 in the left eye. 1-week after injection both eyes showed resolution of macular edema and visual improvement to 0.8 in both eyes.

Conclusions: Penetration to systemic circulation has been showed after unilateral Ozurdex injection. However, disturbance in the blood-retina barrier may be responsible for unilateral intravitreal Ozurdex to reach therapeutic level in the other eye.

Acknowledgements: None.

Keywords: Contralateral Effect, Dexamethasone, Macular Edema, Uveitis.

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Treatment of Retinitis Pigmentosa-Related Cystoid Macular Edema; Intravitreal Dexamethazone Implant in One and Intravitreal Anti-VEGF in the Other Eye and Electrophysiological Outcomes

Dorukcan Akincioglu, Murat Küçükercilioğlu, Ali Hakan Durukan

Gülhane Military Medical Academy, Ankara, Turkey

Introduction: Cystoid macular edema is seen in %20 of patients with retinitis pigmentosa causing decreased central vision. Various intravitreal injections and surgical techniques have been reported in the management of macular edema in retinitis pigmentosa patients with unfavorable results. Use of topical or systemic carbonic anhydrase inhibitors is thought to be effective to help retina pigment epithelium draining intraretinal and subretinal fluid. We aim to present our results in a case with macular edema related to retinitis pigments.

Methods or Study Design: A 27 year-old male presented with decreased vision. His best corrected visual acuity was 0.40 (LogMAR) on both eyes. Complete ophthalmologic examination revealed pigmenter retinopathy and macular edema. Visual acuity, clinical examination and optical coherence tomography were performed before and after treatment.

Results: Patient was informed with the off-label nature and potential side effects of intravitreal dexamethasone implantation, intravitreal ranibizumab and intravitreal aflibercept injections. He consented to treatment with monthly intravitreal ranibizumab in his right eye and single dose intravitreal dexamethasone implantation in his left eye. Repeated electrophysiological tests revealed no improvement.

Conclusions: Intravitreal dexamethazone, intravitreal ranibizumab and intravitreal aflibercept injections improved neither visual acuity nor amplitudes. Optical coherence tomography revealed no improvement in macular thickness.

Acknowledgements: I am grateful to my mentors for helpful advice and discussions about the manuscript.

Keywords: Aflibercept, Bevacizumab, Dexamethazone, Retinitis Pigmentosa.

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Pneumotic Retinopexy and Laser Photocoagulation in the Management of Serous Macular Detachment Related to Optic Pit

Dorukcan Akincioglu, Murat Küçükercilioğlu, Ali Hakan Durukan

Gülhane Military Medical Academy, Ankara, Turkey

Introduction: Optic pit is known to arise from the incomplete closure of the embryonic fissure. Mostly seen unilateral and located in the temporal region of the optic disc. The serous macular detachments seen with optic disc pits characteristically extend temporally from the optic disc. More temporally pits tend to predispose retinal detachment. The source of the intra- and sub retinal fluid seen in optic disc pit remain mysterious.

Methods or Study Design: We present a case complaining of deteriorated vision in his left eye. Best corrected visual acuity was 0.70 in his left eye. Slit lamp examination was normal but fundus examination revealed optic disc pit and macular detachment.

Results: We administered pneumatic retinopexy with prone positioning. Improved visual acuity was seen however macular edema didn't improve. We performed krypton laser photocoagulation in the temporal edge of the optic disc. Following examinations revealed better anatomic and functional results as laser scar stop the fluid by time. His final visual acuity was 0 in LogMAR. Subjective complaints also improved in the following month.

Conclusions: Temporary endotamponade is never a permanent solution for serous macular detachment related to optic disc pit. Detachment remains as the passage remains.

Acknowledgements: I am grateful to my mentors for helpful advice and discussions about the manuscript.

Keywords: Krypton, Optic Pit, Pneumatic.

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Intravitreal Ranibizumab Treatment in Patients Diagnosed with Idiopathic Choroidal Neovascularization

Sezin Ozdogan Erkul, Ozen Ayranci Osmanbasoglu, Zeynep Kayaarasi Ozturker, Hulya Gungel, Kadir Eltutar

Istanbul Training and Research Hospital, Istanbul, Turkey

Introduction: To evaluate the efficacy of intravitreal ranibizumab treatment in patients diagnosed with idiopathic choroidal neovascularization.

Methods or Study Design: The demographic characteristics of the patients, best corrected visual acuity (BCVA), optical coherence tomography (OCT) findings, treatment results and possible side effects were noted in this retrospective case series. Primary outcome measures were the changing in BCVA and central macular thickness (CMT). All patients were followed up at least for 6 months.

Results: Nine eyes of 9 patients diagnosed with idiopathic choroidal neovascularization under the age of 50 were to put in the study by scanning the files of all patients admitted to the Retina Outpatient Clinic of Istanbul Education and Research Hospital between March 2013 – March 2015. The mean age of the patients was 47.11 ± 2.3 . Treatment with intravitreal ranibizumab as needed (pro re nata [PRN]) was applied for all patients without loading dose. During follow-up period an average of 3.6 injection was applied and all of the choroidal neovascularization lesions have become inactive. Only in one eye subretinal hemorrhage has occurred and that patient ended with a lower visual acuity. The mean BCVA has increased from 0.6 (logMAR) to 0.43 (logMAR) ($p < 0.05$). The mean CMT has decreased from 356 microns to 269 microns ($p < 0.05$). The mean follow-up time was 16 months. In the follow-up period there wasn't any side effects.

Conclusions: Intravitreal ranibizumab treatment for idiopathic choroidal neovascularization is seen as a safe and effective treatment option. Clinical studies in patients with idiopathic choroidal neovascularization has shown that the good result were obtained with less number of injections. In our study, all the choroidal neo-

vascular membranes have lost the disease activity with an average 3.6 number of injections with a mean follow-up period of 16 months.

Acknowledgements: None.

Keywords: Ranibizumab, Idiopathic, Choroidal, Neovascularization.

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Ocriplasmin Outcome in Real Life Experience

Tarek El-Kashab, Venkat Kotamarthi

MCHFT, Middlewich, United Kingdom

Introduction: Ocriplasmin had been recommended by NICE in UK for treating VMT and stage 2 macular holes.

The aim of this study was to audit the first 24 cases who was treated in MCHFT.

We had included 24 patients who either had symptomatic VMT or stage 2 macular hole.

At least 4 month follow up was mandatory.

Methods or Study Design: This is a retrospective study in the form of an audit.

VA Snellen and Log MAR, CRT, OCT finding were all recorded before and after treatment.

All post injection visits full ocular examination including VA, IOP and fundus examination as well as OCT were done.

Results: 57% of patients with VMT had responded to treatment.

30% of macular holes stage 2 were closed.

No serious complication were recorded.

All patients have been informed before injection about symptoms of PVD.

Conclusions: Our result of relief of VMT were better than literature and we believe the success was due to patient selection.

We were less successful in percentage of macular hole closures which might be due to including few patients with large stage 2 macular holes.

It is very important to warn the patients about symptoms of PVD following injection.

Acknowledgements: Limitation of this study was the small number of participants.

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Ganglion Cell and Inner Plexiform Layers, OCT, HRT and Visual Field Tests: A Comparative Study

André Vicente, Lívio Costa, Manuel Noronha, Vanessa Lemos, Joana Ferreira, Duarte Amado, Teresa Gomes, João Paulo Cunha

Centro Hospitalar Lisboa Central, Lisbon, Portugal

Introduction: To present an analysis of the automated macular ganglion cell complex measurements in patients with glaucoma and a comparison with structural optic disc evaluations performed by OCT and confocal microscopy (HRT). A comparison of the functional damage with structural evaluation was performed.

Methods or Study Design: Retrospective study of 50 eyes of 50 patients with glaucoma followed at our department. Structural evaluation was performed with Optical Coherence Tomography (OCT SPECTRALIS®) with optic disc and macular scans. Ganglion cell layer and inner plexiform layer (GCL+IPL) average thickness and retinal nerve fiber layer (RNFL) thickness were determined. HRT examination was also performed (HRT3® Heidelberg Engineering GmbH) and Disc area, cup area, rim area, cup/disc area ratio, rim/disc area ratio, cup volume, rim volume, mean cup depth, maximum cup depth and average RNFL thickness were determined. Functional evaluation was performed with the mean defect obtained with Static Computerized Perimetry.

Results: RNFL (OCT and HRT evaluation) and GCL+IPL thickness was significantly reduced when compared with patients without glaucoma ($p < 0.05$). RNFL and GCL+IPL thickness decrease evaluated by OCT and HRT were positively correlated. GCL+IPL thickness measurements were significantly correlated with optic disc morphological evaluations performed with HRT. MD was negatively correlated with RNFL and GCL+IPL thickness. The RNFL and MD correlation was stronger when RNFL thickness evaluation was performed with OCT than with HRT. There was a strong positive functional and structural correlation between the tomographic, confocal and perimetric evaluations.

Conclusions: Structural damage evaluated by evaluation of different retinal layers with OCT and optic disc morphology with HRT are similar and closely related to functional damage determined with visual field examinations. Ganglion cell and inner plexiform layer thickness evaluation is a particularly accurate way of predicting early functional damage and its measurement in glaucoma patients seems to be a useful tool in the follow-up of these patients.

Acknowledgements: None.

Keywords: Retina, Glaucoma, OCT, HRT, Ganglion Cells.

Paediatric Diseases

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Early Vitrectomy for Aggressive Posterior Retinopathy of Prematurity

Alexander Vladimirovich Tereschenko, Iurii Alexandrovich Belyi, Yulia Alexandrovna Sidorova, Irina Georgievna Trifanenkova

Eye Microsurgery Kaluga branch, Kaluga, Russia

Introduction: The goal is to develop a methodology for an early vitrectomy in the surgical treatment of infants with aggressive posterior retinopathy of prematurity (AP-ROP).

Methods or Study Design: 15 prematurely born infants (26 eyes). The main group consisted of 7 children (14 eyes) aged 7–9 weeks (gestational age 28.9 ± 0.9 weeks). They came to the treatment at the stage of manifestation of AP-ROP. Retrospective control group consisted of 8 infants (12 eyes) aged 9–11 weeks (gestational age 31.8 ± 0.9 weeks). They underwent patterns transpupillary

lary laser photocoagulation (PASCAL) of avascular zone of the retina at the manifestation stage of AP-ROP and who had progression of the disease in 8–12 days after laser treatment.

All patients underwent early lens-sparing vitrectomy: in the main group without a preliminary transpupillary laserphotocoagulation and in the control group in the further progression of AP-ROP after pattern transpupillary laserphotocoagulation.

Results: In the main group the fibroproliferative tissue is (FPT) easily removed by a single conglomerate and reminds removing of the 'stocking' from the surface of the retina. In this case, FPT is differentiated, its location, the length, the degree of expansion and the presence of adhesion to the retina is well visualized. In the control group FPT is different at the various stages of maturity on the proliferation ridge, which does not allow to clearly differentiate and fully remove it.

In the main group (14 eyes) full adherence of the retina was achieved in 12 eyes, partially in 2 cases. In the control group the retina lay down fully only in 6 cases.

Conclusions: Early lens-sparing vitrectomy in infants at the stage of manifestation of AP-ROP without a preliminary transpupillary laser photocoagulation allows to remove pathologically altered vitreous body and fibroproliferative tissue, to perform the endolaserphotocoagulation with the minimum of intraoperative complications.

Acknowledgements: None.

Keywords: Early Vitrectomy, Aggressive Posterior Retinopathy of Prematurity.

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Ophthalmological Data of Premature Infants in a Tertiary Care Hospital in Turkey

Ayşe Nihal Demircan, Ebru Esen, Selcuk Sizmaz, Ayna Sariyeve

Cukurova University, Adana, Turkey

Introduction: To evaluate the infants who underwent retinopathy of prematurity (ROP) screening in order to determine the incidence with respect to birth weight and features of babies who require treatment.

Methods or Study Design: Records of infants who underwent ROP examination at Cukurova University Medical Faculty between April 2012-May 2014, were investigated retrospectively. Birth age, birth weight and ROP stage were enrolled.

Results: We detected ROP in 314 (48.3%) of 650 premature infants. Ninety (13.8%) of the cases were diagnosed as treatment requiring ROP and 78 (12%) of them underwent laser photocoagulation. Twelve (1.2%) patients who were referred from different centers were found to be at stage 4 and 5 at the first examination and vitreoretinal surgery was recommended. Mean gestational age of cases who required treatment was 27.9 ± 2.2 (24–33) weeks and birth weight was 1083.54 ± 343.74 (540–2050) grams. The birth weight was >1500 grams, and gestational age was >32 weeks in 8 of these patients and were referred from different centers.

Conclusions: In order to minimize visual loss due to ROP awareness should be stimulated throughout the neonatal intensive care units of the country. Delicate ROP examinations and regular screening programs should be performed at these units.

Acknowledgements: The authors have no financial relationships with any commercial interest related to the content of this study.

Keywords: Retinopathy of Prematurity, Premature Infants.

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Prevalence of Retinopathy of Prematurity in the South-East Region of Turkey

Oguzhan Saygili¹, Eyup Ozcan¹, Sabit Kimyon², Alper Mete¹, Serhat Kenan¹, Mithat Temizer³

¹Gaziantep University Ophthalmology Department, Gaziantep, Turkey; ²Sehitkamil Public Hospital Ophthalmology Department, Gaziantep, Turkey; ³Gaziantep University Public Health Department, Gaziantep, Turkey

Introduction: The purpose of this study is to determine the prevalence of retinopathy of prematurity (ROP) in a tertiary ophthalmology department in Gaziantep which is a city in the south-east region of Turkey.

Methods or Study Design: The medical records of premature infants examined between March 2010 and February 2013 in the ophthalmology department of Gaziantep University School of Medicine were included in this retrospective study. Preterm infants with gestational age (GA) 32 weeks or below, and with birth weight (BW) 1500 gr or less were included in this study.

Results: We included 1396 eyes of 698 preterm babies in our study. Of the screened infants, 445 (63.8%) didn't have ROP while 253 (36.2%) of them had any stage ROP. The mean BW of the infants who didn't have ROP was 1380.44 ± 265.52 gr while the mean BW of the patients with any stage ROP was 1221.7 ± 264.97 gr ($p < 0.001$). The mean GA of the infants who didn't have ROP was 30.6 ± 1.98 weeks while the mean GA of the patients with any stage ROP was 29.2 ± 2.17 weeks ($p < 0.001$). Stage of ROP increased significantly as the BW ($p < 0.001$) and GA decreased ($p < 0.001$). There were 59 infants with multiple gestation in our study. Multiple gestation did not affect the presence of ROP.

Conclusions: The prevalence of ROP in the southeast region of Turkey is similar to the tertiary referral hospitals in the western areas. Low birth weight and low gestational age are risk factors for the development of ROP. Multiple gestation does not affect the presence of ROP.

Acknowledgements: We do not have someone to acknowledge to.

Keywords: Retinopathy of Prematurity, Prevalence, Multiple Gestation.

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13-Year-Old Girl with Severe Vision Loss and a Retinitis Pigmentosa-Like Alterations in Fundus with Polyautoimmune Diseases

Wojciech Jan Stec¹, Grzegorz Jasina¹, Przemyslaw Pawlowski²

¹Student's Scientific Club at the Laboratory of Electrophysiology of Vision, Bialystok, Poland; ²Laboratory of Electrophysiology of Vision/Department of Pediatric Ophthalmology with Strabismus Treatment Unit, Bialystok, Poland

Introduction: We describe a retinitis pigmentosa-like alterations in fundus and retinal function in a girl with autoimmune background retinitis.

Methods or Study Design: A 13-year-old girl with nyctalopia and progressive loss of vision was referred to the Laboratory of Electrophysiology for ERG tests and consultation. In the general history: at the age of 1 year and 8 months MMR vaccination was given. After the vaccination measles-like rash with fever occurred, followed by autoimmune hepatitis. Later on, loss of hair (alopecia areata) and nails occurred, autoimmune hypoparathyroidism, adrenal insufficiency and vitamin B12 deficiency anemia were diagnosed.

Results: At the age of 3 years ophthalmic examination revealed, hyperopia with astigmatism, pigment clumping in the retina, epiretinal membrane (macular pucker).

In the full-field electroretinogram both scotopic and photopic responses was extinguished. The function of central retina was severely reduced in the multifocal ERG. The fundi revealed pigment clumpings and 'bone spicules' in the whole retina, which may suggest advanced retinitis pigmentosa. In addition loss of peripheral vision was diagnosed in the perimetry.

Conclusions: The result confirms advanced rod-cone dystrophy masking RP, which probably occurred because of the autoimmune process.

Acknowledgements: Publications:

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Aaltonen J, Bjorses P, Sandkulijl L: An autosomal locus causing autoimmune disease: autoimmune polyglandular disease type I assigned to chromosome 21, Nature Genetics 1994.

Gass' Atlas of Macular Disease Retinitis Pigments and Autoimmune polyendocrinopathy Anita Agerwal.

Keywords: Retinitis Pigmentosa, Polyautoimmune, Autoimmune, Rod-Cone Dystrophy, Pediatrics.

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OCEAN: First Data of Patients with Macular Edema Due to Central Retinal Vein Occlusion after Completed Patient Recruitment

Sandra Liakopoulos¹, Steffen Schmitz-Valckenberg², Georg Spital³, Frank G. Holz², Thomas Bertelmann⁴, Focke Ziemssen⁵

¹CIRCL Reading Center, Department of Ophthalmology, University of Cologne, Germany; ²University Eye Hospital, Bonn, Germany; ³Eye Clinic, St. Franziskus Hospital, Münster, Germany; ⁴University Eye Hospital, Marburg and Novartis Pharma GmbH, Nuremberg, Germany; ⁵University Eye Hospital, Tübingen, Germany

Introduction: The non-interventional OCEAN study is the largest ophthalmic study conducted in Germany to evaluate the real world situation of patients being treated with ranibizumab.

Methods or Study Design: During the observation period of up to 24 months the recorded parameters include: number of visits, visual acuity, central retinal thickness (CRT), and ranibizumab injections. All treatments including diagnoses and monitoring are performed according to routine practice management and the assessment of the investigator. The statistical analysis is purely descriptive.

Results: A total of 121 recruited patients with CRVO (57 (47%) male, 64 (53%) female) were included in the full analysis set. The mean age was 70.3 ± 11.5 years. The majority of patients was treatment naïve (87; 72%). Worsening of vision occurred in 109 patients (90%), the mean time from worsening of vision to the first injection within the NIS was 3.9 ± 10.6 months (median 1.5 months). Follow-up information after 1 year is available for 85 patients (70%). The mean best corrected visual acuity (BCVA) at baseline was 43.7 ± 25.0 ETDRS letters ($n = 118$), improved during the first 3 months to 54.2 ± 24.7 ETDRS letters ($n = 92$) and had stabilized after 12 months at 50.9 ± 27.1 ETDRS letters ($n = 61$). OCT was performed at baseline in 86 patients (71%). The mean CRT at baseline was $562.5 \pm 248.7 \mu\text{m}$ ($n = 73$), decreased to $341.6 \pm 167.9 \mu\text{m}$ ($n = 57$) after the first 3 months and had stabilized after 12 months at $342.8 \pm 174.9 \mu\text{m}$ ($n = 26$). The mean number of ranibizumab injections per patient within the first year was 5.06 ± 2.48 .

Conclusions: The effectiveness of ranibizumab in the treatment of CRVO could be confirmed by an increased BCVA and a decreased CRT. For this ongoing study, further long-term results are expected.

Acknowledgements: None.

Keywords: Central Retinal Vein Occlusion (CRVO), Non-Interventional Study, Ranibizumab.

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Recovery of Visual Acuity and Foveal Photoreceptor Integrity after Dexamethasone Intravitreal Implant in Macular Edema Secondary to Retinal Vein Occlusion

Verónica Castro-Navarro, Enrique Cervera-Taulet, Clara Torralba-Rull, Javier Montero-Hernández, Laura Hernández-Bel

Hospital General Universitario de Valencia, Valencia, Valencia, Spain

Introduction: Little information is known about intravitreal dexamethasone (DEX) regarding integrity of outer retina. With the present study, we aimed to identify changes in ellipsoid zone (EZ) and external limiting membrane (ELM) integrity using Spectral-domain optical-coherence-tomography (SD-OCT) findings in macular edema (ME) secondary to retinal vein occlusion (RVO) treated with DEX and its association with best corrected visual acuity (BCVA).

Methods or Study Design: Retrospective study of patients who underwent one DEX due to ME-RVO from January 2014 to October 2014 at Hospital General de Valencia. SD-OCT scans were made 15 days before DEX injection and three months after treatment. Central macular thickness (CMT) and macular volume (MV) were automatically generated. A well-trained technician manually measured the length of EZ and ELM layer within 1 mm nasal and temporal from the fovea. Statistical significance was defined as P values < 0.05 . A Wilcoxon-test or Spearman's rank correlation coefficient were used.

Results: Sixteen eyes (Branch-RVO = 9, Central-RVO = 7) were analyzed. Baseline BCVA was 0.20 ± 0.19 dec. Preoperative CMT and MV were $514.25 \pm 155.24 \mu\text{m}$ and 10.99 ± 2.39 cc, respectively. An initial ELM length of $1325.75 \pm 549.68 \mu\text{m}$ and EZ length $1303.25 \pm 506.25 \mu\text{m}$ were found.

Three months postoperative, BCVA improved to 0.38 ± 0.07 dec ($p = 0.002$), and a decreased in CMT ($298.31 \pm 125.59 \mu\text{m}$; $p = 0.004$) and MV (8.24 ± 1.82 cc; $p = 0.001$) was observed. ELM increased to 1710.0 ± 236.12 ($p = 0.006$) and EZ to $1670.31 \pm 282.25 \mu\text{m}$ ($p = 0.005$).

Preoperative BCVA with ELM and EZ integrity were correlated ($R = 0.58$, $p = 0.017$; $R = 0.65$, $p = 0.006$). In the same way, preoperative BCVA ($R = 0.71$, $p = 0.002$), ELM ($R = 0.38$, $p = 0.13$) and EZ length ($R = 0.52$, $p = 0.035$) were associated with post-operative BCVA.

Conclusions: Even though pre-operative BCVA has a stronger prognostic value, ELM and EZ integrity constitute useful hallmarks closely associated with BCVA. In the current study, the results indicated that after one DEX there is an increased visual acuity associated with macular edema decrease, and a restoration in ELM and EZ integrity.

Acknowledgements: No financial disclosure.

Keywords: Retinal Vein Occlusion, Macular Edema, Dexamethasone Intravitreal Implant, External Limiting Membrane, Ellipsoid Zone.

Evaluation of Vitreomacular Adhesion as a Prognostic Factor for the Response to Single Injection of Intravitreal Dexamethasone Implant

Osman Cekic, Semra Akkaya Turhan

Department of Ophthalmology, Marmara University Medical School, Istanbul, Turkey

Introduction: To evaluate the baseline effect of vitreomacular adhesion (VMA) on the final visual and anatomic outcomes of a single intravitreal dexamethasone implant for macular edema and branch retinal vein occlusion.

Methods or Study Design: This study enrolled 15 eyes of 15 patients that underwent a single injection of 0.7 mg dexamethasone intravitreal implant for the treatment of macular edema from branch retinal vein occlusion. The patients were evaluated with detailed ophthalmic examination including Snellen best-corrected visual acuity measurements and optical coherence tomography-based central macular thickness. Status of VMA was decided by fourier-domain optical coherence tomography. The eyes were divided into the groups according to the presence of VMA at baseline.

Results: This study presents 4 months of follow-up results. The VMA (+) group consisted of 9 while VMA (–) group consisted of 6 eyes. Before injection, two groups had similar visual acuity ($p = 0.45$) and central macular thickness ($p = 0.6$, Mann-Whitney test). Baseline median Snellen visual acuity in the VMA (+) group improved from 0.32 to 0.90 ($p = 0.012$) and that of VMA (–) group improved from 0.26 to 0.56 ($p = 0.027$) at the final examination (Wilcoxon test). The VMA (+) group showed better improvement in the best-corrected visual acuity than did the VMA (–) group ($p = 0.043$). The median baseline and the final central macular thickness in VMA (+) eyes were 512 μm and 295 μm ($p = 0.028$) while those in VMA (–) eyes were 542 μm and 298 μm ($p = 0.04$). Final values of central macular thickness did not differ between two groups ($p = 0.9$).

Conclusions: The VMA (+) and VMA (–) eyes showed similar anatomic outcomes while the presence of VMA seems to be associated with better visual improvement after single intravitreal depot dexamethasone injection for macular edema secondary to branch retinal vein occlusion.

Acknowledgements: Financial Interest: No.

Keywords: Branch Retinal Vein Occlusion, Dexamethasone Implant, Macular Edema, Prognosis, Vitreomacular Adhesion.

Prediction of Visual Acuity by Tracking of Hyperreflective Foci after Slow-Release Dexamethasone Intravitreal Implant for Macular Edema and BRVO

Osman Cekic, Semra Akkaya Turhan

Department of Ophthalmology, Marmara University Medical School, Istanbul, Turkey

Introduction: To determine whether the presence of hyperreflective foci on optical coherence tomography at baseline positively affect the visual outcomes after intravitreal dexamethasone implant in branch retinal vein occlusion (BRVO).

Methods or Study Design: The clinical records of patients treated with dexamethasone implant were retrospectively studied. The presence of hyperreflective foci was evaluated following dexamethasone injection in 14 eyes of 10 patients with macular edema related to BRVO. Patients were divided into two groups according to the location of hyperreflective foci on optical coherence tomography: hyperreflective foci located in outer retinal layers and hyperreflective foci located in inner retinal layers. Main outcome measures were best-corrected visual acuity, central macular thickness, status of external limiting membrane, status of junction between photoreceptor inner and outer segments (IS/OS), and the number of hyperreflective foci on parafoveal area.

Results: The average number of injection was 1.4 within a mean follow-up time of 10 months. There were 9 eyes with hyperreflective foci located in outer retinal layers and 5 eyes with hyperreflective foci located in inner retinal layers. Neither baseline central macular thickness nor visual acuity was different between two groups ($p = 0.73$ and $p = 0.34$, respectively). Final visual acuity was better in eyes with hyperreflective foci located in outer retinal layers than those located in inner retinal layers ($p = 0.05$). Status of external limiting membrane and IS/OS did not correlate with the visual acuity at the last follow-up. Before injection, the number of hyperreflective foci on parafoveal area was graded as ‘few’ in 9 eyes and as ‘moderate’ in 5 eyes. At the final visit, there were 14 ‘few’ but no ‘moderate’ hyperreflective foci detected on parafoveal area.

Conclusions: The location of hyperreflective foci may be used to predict final visual acuity after injection of dexamethasone releasing intravitreal implant. The number of ‘moderate’ hyperreflective foci decreases with the treatment in eyes with BRVO.

Acknowledgements: Financial Interest: No.

Keywords: Branch Retinal Vein Occlusion, Dexamethasone Implant, Hyperreflective Foci, Intravitreal Injection, Macular Edema.

Latest Results from LUMINOUS: Baseline Characteristics of Over 2,000 Retinal Vein Occlusion Patients Treated with Ranibizumab in Routine Clinical Practice

Christopher S. Brand

Eye Department, Royal Hallamshire Hospital, Sheffield, United Kingdom

Introduction: LUMINOUS™ is the largest prospective observational trial in medical retina. It is designed to evaluate the long-term safety, effectiveness, treatment patterns and health-related quality-of-life associated with ranibizumab treatment in clinical practice for all licensed indications in over 30,000 patients across 43 countries. Results from the cohort of 2,254 retinal vein occlusion (RVO) patients (1,272 BRVO and 982 CRVO) from study start (March 2011) to March 2015 are described.

Methods or Study Design: Treatment-naïve (T1), prior ranibizumab treated (T2) or other prior ocular treated (T3) patients were enrolled for indications as per the local label.

Results: A total of 2,254 RVO patients were recruited prior to March 2015, of whom, 1,272/982 had BRVO/CRVO; 372/312 in T1, 724/516 in T2, and 176/154 in T3. Mean age for BRVO/CRVO patients was 69.0/69.5, 75.4/79.5% were Caucasian and 50.6/41.9% were female. Mean baseline visual acuity (VA, ETDRS letters) for BRVO/CRVO was higher in T2 (58.7/48.7) than T1 (50.7/40.9) and T3 (49.4/37.4). Median time from diagnosis of BRVO/CRVO to first treatment was 1.3/1.7 weeks for T1. Time from diagnosis to study entry was 48.6/46.0 weeks and 30.7/28.0 weeks for T2 and T3 groups, respectively.

Baseline comorbidities for BRVO/CRVO included 4.5/4.8% of patients with prior myocardial infarction, 3.9/3.5% with stroke, 16.0/14.3% with family history of coronary artery disease, 61.6/59.6% were hypertensive, 17.1/22.2% with diabetes and 13.4/10.9% were obese.

Conclusions:

- The LUMINOUS study includes an extensive demographic range of patients with diverse baseline characteristics representative of the real-world.
- Overall, VA baseline values were lower (approximately 10 ETDRS letters) in CRVO patients than patients with BRVO.
- Prior ranibizumab treatment was associated with higher VA baseline values than the treatment-naïve patients and those previously treated with other ocular therapies.
- Future follow-up data from the BRVO/CRVO patients recruited will provide an invaluable source of information on the long-term safety and efficacy of ranibizumab in routine clinical practice.

Acknowledgements: Authors received writing support for this abstract from Maryanne Donovan (Global Business Services, Novartis Ireland Ltd.).

Keywords: LUMINOUS, Ranibizumab, Retinal Vein Occlusion, Real-World, Baseline Characteristics.

Differential Early Response to Dexamethasone Implant after Macular Oedema Secondary to Retinal Vein Occlusion

Suhel Elnayef, Barbara Delas, Gemma Julio, Pamela Campos, Mouafk Asaad

Consorcio Sanitario de Terrassa, Terrassa, Barcelona, Spain

Introduction: Macular oedema (MO) is the main cause of vision impairment after retinal vein occlusion (RVO).

Dexamethasone implant is used to reduce MO and improve patient's vision. This study aims to assess early response to the therapy according to outer retinal layer status.

Methods or Study Design: Twenty-nine eyes of 16 males and 13 females, mean age 65 ± 13 (36–91), with MO after RVO were prospectively enrolled, receiving a single dose of dexamethasone implant (0.7 mg). Exclusion criteria were uncontrolled glaucoma and history of intraocular surgery within 6 months.

Best corrected visual acuity (BCVA; in decimal scale) and central foveal thickness (CFT) were performed at baseline and 1 day after drug administration. The eyes were grouped, according to initial optical coherence tomography images, in G2 (visible external limiting membrane and inner/outer segment junction), G1 (only visible one of these layers) and G0 (no visible layers). Wilcoxon rang test and Student t test were used to compare, VA and CFT intragroup changes, respectively.

Results: Eleven eyes were included in G0, 8 eyes in G1 and 10 eyes in G2.

G0 showed a mean change from VA = 0.04 ± 0.06 to 0.09 ± 0.08 and CFT from 689 ± 171 to 521 ± 168 μm .

G1 displayed a mean change from VA = 0.18 ± 0.16 to 0.30 ± 0.27 and CFT from 529 ± 147 to 419 ± 85 μm .

G2 disclosed a mean change from VA = 0.35 ± 0.08 to 0.32 ± 0.09 and CFT from 472 ± 160 μm to 410 ± 99 μm .

VA showed a weak but significant improvement in G0 and G1 ($p = 0.027$ and 0.028 , respectively) while CFT decreased in both groups ($p = 0.002$ and 0.043 , respectively). No significant changes were found in G2.

Conclusions: Early effect of dexamethasone implant depends on outer retinal layer status. The drug seems to produce faster significant changes in more altered tissues.

Acknowledgements: No financial disclosure.

Keywords: Macular Oedema, Retinal Vein Occlusion, Visual Acuity, Dexamethasone Implant, Outer Retinal Layers.

Ultra Wide-Field Fluorescein Angiography Abnormalities in Fellow Eyes of Patients with Unilateral Central Retinal Vein Occlusion

Luke Nicholson, Clara Vazquez-Alfageme, Philip G. Hykin, Sobha Sivaprasad

NIHR Moorfields Biomedical Research Centre and UCL Institute of Ophthalmology, London, United Kingdom

Introduction: Ultra wide-field (UWF) imaging has improved our assessment of the peripheral retina. Peripheral changes on UWF fluorescein angiography (UWF-FA) have been reported in pathologic myopia (82.6%), emmetropia (81.0%), age-related macular degeneration (17%) and fellow eyes of branch retinal vein occlusion (11.1%). In a recent paper, from a small cohort ($n = 9$), peripheral abnormalities were observed in 22.2% of fellow eyes of non-ischemic central retinal vein occlusion (CRVO). The objective of this study was to report vascular abnormalities in UWF-FA in a large cohort of fellow eyes of patients with unilateral CRVO.

Methods or Study Design: Good quality UWF-FA images of normal fellow eyes of patients with unilateral CRVO obtained from January 2014 to December 2014 were assessed. Images were graded for presence of peripheral telangiectasia, peripheral vessel wall staining or leakage and peripheral avascular areas. The location of these changes defined as superior, inferior, nasal or temporal periphery was also documented.

Results: Images of 77 patients were evaluated. 57.1% were male and 54.5% were right eyes. The mean age was 65.9 years. 35 patients (45.5%) were classified as having normal periphery and 42 (54.5%) had the pre-defined abnormalities. Peripheral telangiectasia were noted in 38 (49.4%) of fellow eyes and of this, 16 (42.1%) were only temporal, 2 (5.3%) only nasal and 20 (52.6%) both temporal and nasal. Peripheral vessel staining or leakage was present in 2 (2.6%) of fellow eyes and areas of avascular retina was present in 6 (7.8%) of eyes.

Conclusions: Peripheral retinal vascular abnormalities are present in 49.4% of fellow eyes of unilateral CRVO patients. The most common abnormality is peripheral telangiectasia. This may represent a subclinical finding that predisposes a patient to CRVO or just a spectrum of normality given a new imaging modality.

Acknowledgements: NIHR Moorfields Biomedical Research Centre and UCL Institute of Ophthalmology, London, United Kingdom.

Keywords: Ultra Wide-Field Fluorescein Angiography, Central Retinal Vein Occlusion, Fellow Eyes.

Cytokine Imbalance in Retinal Vein Occlusion, and Its Relation to an Effective Anti-VEGF Therapy

Andrey G. Shchuko, Igor V. Zlobin, Tatiana N. Iureva

The Academician S.N. Fyodorov Federal State Institution «Intersectoral Research and Technology Complex «Eye Microsurgery» Ministry of Health of Russian Federation», Irkutsk, Russia

Introduction: This is the study of intraocular cytokines concentration change in patients with retinal vein occlusion (RVO) before and after ranibizumab administration. The findings were compared with the disease activity and effectiveness of the treatment.

Methods or Study Design: A comprehensive eye examination of 44 patients with RVO and macular edema was held. Every patient, before planned ranibizumab administration, was taken aqueous humor and then it was further laboratory tested with determination of the concentration of 27 cytokines. The same examination in a month was made.

Results: 11 cytokines out of 27 with a high degree of reliability were determined in the aqueous humor in patients with RVO. After the ranibizumab injection the balance of cytokines in aqueous humor has changed in varying degrees of expression. That depended on the initial severity of ischemic damage to the retina. The greatest change in the concentration of VEGF was revealed in group with central retinal vein occlusion (CRVO) in 27 times with 1725.24 ± 946.95 pg/ml and 63.11 ± 55.01 pg/ml, and in group with occlusion of the branches of the central retinal vein occlusion (BRVO) – in 5 times with 919.07 ± 533.2 pg/ml to 197.55 ± 271.55 pg/ml. Some inflammatory factors (IL-6, -8, -13, -15, MCP-1) also demonstrate severe reduction after an anti-angiogenic therapy in a group with CRVO and BRVO. It should be noted that the clinical effect of the anti-VEGF therapy in CRVO and BRVO groups depended not only on the initial severity of retina ischemic damage, but the initial concentration of the cytokines listed above. In particular, the concentration of cytokine in the CRVO group before the ranibizumab injection exceeded cytokine concentrations in BRVO group on average in 3 times.

Conclusions: RVO accompanied immune-inflammatory cascade of reactions comprising the activation not only VEGF, but and inflammatory and chemotactic factors which activity depends on the depth of ischemic retinal injury.

Acknowledgements: No.

Keywords: RVO, Aqueous Humor Cytokines, Ranibizumab, Retinal Ischemia.

Ranibizumab versus Dexamethasone to Treat Macular Edema in Patients with Retinal Vein Occlusion: Long-Term Results of the COMRADE-EXTENSION Study

Nicolas Feltgen¹, Thomas Bertelmann²

¹University Eye Hospital, Göttingen, Germany;

²Novartis Pharma GmbH, Nuernberg, Germany

Introduction: To compare the efficacy and safety of 0.5 mg ranibizumab (RAN) vs. 0.7 mg dexamethasone implant (DEX) in patients with macular edema due to branch (BRVO) or central retinal vein occlusion (CRVO) over 12 months in a phase 3b comparative study.

Methods or Study Design: Patients completing COMRADE-B/COMRADE-C core phase were included into the EXTENSION study. After 6 months RAN and DEX treatments were continued on a PRN treatment strategy.

Results: 92 BRVO/83 CRVO affected eyes were included. Eyes with BRVO presented a gain in BCVA from baseline to month 6 (CORE study) and 12 (EXTENSION study) of 19.8 (95% CI: 16.6; 23.0) and 20 (16.7; 23.3) ETDRS letters in RAN (n = 52) and of 11.7 (8.1; 15.3) and 12.3 (8.5; 16.0) in DEX treated eyes (n = 40) (p < 0.001/p = 0.001). FCP (foveal center point thickness) decreased by 315.3 ± 214.3/341.8 ± 226.2 µm from baseline to months 6/12 in RAN and 169.4 ± 205.3/252.5 ± 197.9 µm in DEX group (p < 0.001/p = 0.006). Eyes with CRVO had a gain in BCVA from baseline to month 6 and 12 of 18.2 (14.5; 21.8) and 18.9 (14.9; 22.9) ETDRS letters in RAN (n = 60) and of 9.6 (3.5; 15.6) and 11.9 (5.3; 18.6) in DEX treated eyes (n = 23) (p = 0.015/p = 0.069). FCP decreased by 427.9 ± 303.8/439.4 ± 279.8 µm from baseline to months 6/12 in RAN and 356.6 ± 246.6/432.3 ± 245.8 µm in DEX group (p = 0.179/p = 0.349). An IOP ≥ 21 mm Hg was noted in 7 RAN (13.5%) and 29 DEX eyes (72.5%) in BRVO and in 16 RAN (26.2%) and 13 DEX eyes (59.1%) in CRVO (p < 0.001/p = 0.009). Cataract development or worsening (BRVO/CRVO) was seen in 2 RAN (3.8%) and in 6 DEX (15.0%) (p = 0.074)/3 RAN (4.9%) and in 1 DEX (4.5%) (p = 1) eyes.

Conclusions: The superior effect of RAN over DEX on BCVA development was maintained up to 12 months. FCP thickness in RAN group was stable at a lower level than in DEX group. The proportion of patients with an episode of elevated IOP was considerably higher in the DEX group.

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Keywords: Macular Edema, Branch Retinal Vein Occlusion, Central Retinal Vein Occlusion, Ranibizumab, Dexamethasone.

Management of Macular Edema Secondary to Retinal Vein Occlusion by Spanish Retina Specialists in Real-World Practice

M.J. Abrolades¹, A. Pareja², M. Roura³, From The Observar Study Group³

¹Complejo Hospitalario Universitario de Santiago de Compostela, Universidad de Santiago de Compostela, A Coruña, Spain; Red Temática de Investigación Cooperativa en Salud (RETICS), Instituto de Salud Carlos III, Madrid, Madrid, Spain; ²Hospital Universitario de Canarias, Tenerife, Santa Cruz de Tenerife, Spain; ³Novartis Farmacéutica, S.A., Barcelona, Barcelona, Spain

Introduction: Treatment of macular edema secondary to retinal vein occlusion (ME-RVO) has changed a lot last years with the approval of drugs such as anti vascular endothelial growth factor (anti-VEGF). We aimed to describe the clinical management of ME-RVO by Spanish retinologists in clinical practice.

Methods or Study Design: Observational, retrospective, multicenter study. Forty-two retinologists collected clinical and demographic characteristics from clinical histories of adult ME-RVO patients and answered questionnaires about initial and confirmatory diagnosis, diagnostic tests and treatments/regimens.

Results: 194 ME-RVO patients (mean age: 66.3 [standard deviation (SD) 12.4] years, 55.7% men, 100% unilateral, 72.2% branch retinal vein occlusion) were analyzed. Retinologists considered progressive loss of visual acuity (VA) to be the main symptom suggesting ME-RVO (>65.9%). Most common diagnostic tools used were ETDRS (95.5%), OCT (95.5%), biomicroscopy (93.2%) and fluorescein angiography (>68.2%). Time from diagnosis to treatment initiation was 1 month in the majority of cases (>63.6%). Over 56.8% of retinologists based ME-RVO first-line treatment on anti-VEGF drugs (100% ranibizumab). 34.1%, 6.8% and 36.4% of retinologists used 1, 2 and 3 initial anti-VEGF injections respectively. 47.7% scheduled bi-monthly follow-up visits during the first year post-diagnosis, extended to quarterly visits afterwards (38.6%). Mean ETDRS letters showed a stabilization or even improvement of VA after treatment, changing from 51.8 [SD 22.7] at diagnosis to 60.1 [SD 22.0] mean letters at first follow-up visit, and 61.6 [SD 22.5] in last visit. OCT also revealed a reduction in mean foveal thickness measurement: 512.1 [SD 186.7] µm at diagnosis to 323.8 [SD 111.5] µm in last visit.

Conclusions: Our data suggest that Spanish retinologists use homogeneous criteria regarding diagnosis, treatment and follow up of ME-RVO, and that treatments used in clinical practice result in improvements in visual acuity and reduction in mean foveal thickness. A majority of retinologists considered ranibizumab as ME-RVO first-line treatment (>56.8%).

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Study sponsored by Novartis Pharma AG.

Keywords: Macular Edema Secondary To Retinal Vein Occlusion, Ranibizumab, Real World Clinical Practice.

Choroidal Thickness Changing in Retinal Vein Occlusion after the Treatment of Dexamethasone Implant

Fatih M. Adibelli, Mustafa Güzey, Tugba Goncu, Ali Akal

Harran University School of Medicine, Sanliurfa, Turkey

Introduction: The purpose of this study is to investigate the choroidal thickness changes in the eyes with retinal vein occlusion (RVO) and to determine the effect of intravitreal dexamethasone implant on choroidal thickness.

Methods or Study Design: This study comprised 30 patients diagnosed with unilateral, RVO associated with macular edema (MO) and treated by dexamethasone implant. Enhanced depth imaging optical coherence tomography (EDI-OCT) was performed for all patients. Baseline subfoveal choroidal thickness (SFCT) and central macular thickness (CMT) of the RVO eyes were compared with those of the normal contralateral eyes.

Results: The mean SFCT was significantly higher in RVO eyes at baseline ($246.93 \pm 43.09 \mu\text{m}$) than it was in contralateral eyes ($220.8 \pm 38.95 \mu\text{m}$; $p < 0.001$). The mean SFCT decreased at 3 months after dexamethasone implant injection and there was no significant difference between the treated ($222.63 \pm 33.14 \mu\text{m}$) and the normal contralateral eyes ($219.77 \pm 38.49 \mu\text{m}$; $p < 0.4$). The change in SFCT wasn't correlated with the change in CMT at 3 months ($r = 0.105$; $p = 0.582$).

Conclusions: SFCT in eyes with RVO was significantly greater than it was in normal contralateral eyes. After dexamethasone implant injection, SFCT decreased significantly.

Acknowledgements: We acknowledge the statistically supports of Ibrahim Koruk.

Keywords: Choroidal Thickness, Retinal Vein Occlusion, Dexamethasone Implant.

Individualised Ranibizumab 0.5 mg Treatment in Patients with Visual Impairment Due to Macular Oedema Secondary to Central Retinal Vein Occlusion: 24-Month Results of the CRYSTAL Study

Michael Larsen

Glostrup Hospital and National Eye Clinic, Copenhagen, Denmark

Introduction: The CRYSTAL study (NCT01535261) was designed to provide long-term efficacy and safety data for individualised, stabilisation criteria-driven pro re nata dosing regimen of ranibizumab 0.5 mg in patients with visual impairment due to macular oedema secondary to central retinal vein occlusion (CRVO). Here we present the 24-month results from CRYSTAL.

Methods or Study Design: A 24-month, phase IIIb, open-label, single-arm, multicentre study. Patients received monthly ranibizumab until stable visual acuity (VA) for 3 consecutive months. Thereafter, ranibizumab was administered upon monitoring-

based signs of VA deterioration. VA and disease activity were monitored monthly up to Month 12 and either monthly or bi-monthly thereafter, depending on VA stability and absence of disease activity.

Key Endpoints: Mean change in best-corrected VA (BCVA) compared to baseline, at Month 12 (primary), and from Months 1 through 12 and 24, as well as safety over 24 months.

Results: Of the 357 patients enrolled, 307 (86%) completed the 24-month study. Mean/median prior duration of CRVO at baseline was 8.9/2.4 months and 54.1% of patients had CRVO for a duration of < 3 months. Mean BCVA at baseline was 53.0 letters and 41.5% of patients had VA ≥ 60 letters. At Months 12 and 24, an average of 8.1 and 13.1 ranibizumab injections resulted in a significant mean ($\pm$ SD) gain in BCVA from baseline of 12.3 (± 16.72 , $p < 0.0001$; primary) and 12.1 (± 18.60 , $p < 0.0001$) letters, respectively. Ocular serious adverse events were reported in 2.8% of patients, the most common being glaucoma (0.6%), retinal ischaemia (0.6%) and VA reduced (0.6%). Five (1.4%) deaths, none related to the study drug, were reported.

Conclusions: Overall, the 24-month results from the CRYSTAL study confirm that patients with macular oedema secondary to CRVO can be effectively managed with individualised stabilisation criteria-driven ranibizumab dosing regimen. No new safety concerns were reported during the study.

Acknowledgements: The authors received writing support for this abstract from Rhutika Desai (Global Medical and Clinical Services, Novartis Healthcare Pvt. Ltd., Hyderabad, India).

Keywords: Ranibizumab, Central Retinal Vein Occlusion, CRYSTAL, VA, Macular Oedema.

Effect of Macular Ischaemia on Visual Acuity Outcomes in Patients with Branch and Central Retinal Vein Occlusion Undergoing Individualised Treatment with Ranibizumab 0.5 mg: Results from the BRIGHTER and CRYSTAL Studies

Jordi Monés

Institut de la Macula de la Retina, Barcelona Macula Foundation, Barcelona, Spain

Introduction: To report the grading criteria for ischaemia and best-corrected visual acuity (BCVA) outcomes based on baseline macular ischaemia status from the BRIGHTER and CRYSTAL studies.

Methods or Study Design: BRIGHTER and CRYSTAL are two 24-month (M) studies assessing the long-term efficacy and safety of stabilisation criteria-driven pro re nata ranibizumab 0.5 mg (RBZ) in patients with visual impairment due to macular oedema secondary to branch and central retinal vein occlusion (BRVO and CRVO), respectively. In BRIGHTER, patients ($N = 455$) were randomised (2:2:1) to receive RBZ ($n = 183$), RBZ+laser ($n = 180$) or laser alone ($n = 92$). In CRYSTAL, patients ($N = 357$) were assigned to receive RBZ treatment. In both studies, macular ischaemia was defined by Central-Reading-Centre as capillary loss (mild, moderate, severe or completely destroyed) in at least one location of the

centre, inner or outer subfield, based on the ETDRS grading. The exploratory endpoint was mean BCVA change from baseline to M6 (BRIGHTER) and M12 (CRYSTAL) based on baseline ischaemia status.

Results: In BRIGHTER, BCVA gains (M6) were higher with RBZ or RBZ+laser vs laser alone, irrespective of baseline ischaemia status (ischaemic: 74.9 or 73.1 vs 64.7 letters; non-ischaemic: 72.5 or 72.2 vs 63.3 letters) compared with baseline VA (ischaemic: 60.6 or 58.7 vs 55.6 letters; non-ischaemic: 60.6 or 60.4 vs 60.6 letters). The respective mean BCVA changes in patients with mild/moderate and severe ischaemia were +14.6 and +12.9 letters (RBZ) and +14.5 and +14.1 letters (RBZ+laser). In CRYSTAL, at M12, the mean BCVA improved to 66.1 and 67.7 letters in the ischaemic and non-ischaemic patients, compared with baseline VA (54.5 and 55.6 letters, respectively) and improved by +12.0 and +9.9 letters in patients with mild/moderate and severe ischaemia, respectively.

Conclusions: Results from BRIGHTER and CRYSTAL suggest flexible administration of RBZ as an effective therapy for BRVO and CRVO, regardless of patients' baseline ischaemia status as defined in these studies.

Acknowledgements: The author received writing support for this abstract from Mayuri Shinde (GBS-Global Medical and Clinical Services, Novartis Healthcare Pvt. Ltd., Hyderabad, India).

Keywords: Ranibizumab, Retinal Vein Occlusion, Ischaemia, BRIGHTER, CRYSTAL.

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Treatment Frequency of Ranibizumab Injections and Dexamethasone Implants for the Management of Branch Retinal Vein Occlusion (BRVO) and Central Retinal Vein Occlusion (CRVO): A Retrospective Cohort Study Using a US Claims Database

Sylvia Nghiem-Buffet¹, Stephane Regnier², Rita Freitas³, Adrian Skelly⁴, Ning Yu⁵

¹Centre Ophtalmologique d'Imagerie et de Laser, Paris, France;

²Novartis Pharma AG, Basel, Switzerland; ³Wellmer AG, Basel, Switzerland; ⁴Novartis Ireland Limited, Dublin, Ireland; ⁵IMS Health, London, United Kingdom

Introduction: To assess, over the first 12 months, the treatment and visit frequency of intravitreal ranibizumab 0.5 mg and dexamethasone 0.7 mg implant for retinal vein occlusion.

Methods or Study Design: IMS medical claims data was used to identify treatment naive RVO patients (without any anti-VEGF or dexamethasone within 270 days prior to the index date) receiving ranibizumab or dexamethasone implant between June 2010 and February 2014 with at least 12 months follow-up. Eligible patients were divided into BRVO or CRVO based on the index diagnosis, and the mean numbers of total ophthalmology visits and visits resulting with a ranibizumab intravitreal injection or dexamethasone implant were compared.

Results: 2822 patients receiving ranibizumab (n = 1178 for CRVO and 1644 for BRVO) and 365 patients receiving dexamethasone implant (n = 191 for CRVO and 174 for BRVO) were identified.

Ranibizumab patients were older than dexamethasone patients in CRVO (72.8 vs 68.8, $p < 0.001$) but comparable in BRVO (73.3 vs. 72.7, $p = 0.53$). Mean number of total ophthalmology visits [SD] for ranibizumab patients was 7.2 [3.6] in CRVO and 7.1 [3.4] in BRVO vs. 6.2 [3.1] and 6.3 [3.1] for dexamethasone implant ($p < 0.001$ in CRVO and $p = 0.016$ in BRVO, after controlling for differences in baseline characteristics). Mean number of treatment visits was higher for ranibizumab than for dexamethasone implant in CRVO (4.1 [2.7] vs 1.8 [1.0], $p < 0.0001$) and in BRVO (3.9 [2.6] vs 1.7 [1.0], $p < 0.0001$). Mean total visit interval was 47.4 days [25.6] for ranibizumab and 57.3 days [35.9] for dexamethasone ($p < 0.0001$).

Conclusions: In routine clinical practice, patients treated with ranibizumab visit an ophthalmologist once more in the first 12 months than patients treated with dexamethasone implant. Our results suggest that ranibizumab does not substantially increase the burden of visits for patients. Therefore, treatment decision between anti-VEGF and steroid implant should be made on the basis of clinical benefits.

Acknowledgements: This study was supported by funding from Novartis Pharma AG, Basel, Switzerland.

Keywords: Retinal Vein Occlusion, Ranibizumab, Intravitreal Dexamethasone Implant, Injection/Implant Frequency, Real World Evidence.

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Does Sustained-Release Dexamethasone Intravitreal Implant Induce Anisocoria?

Osman Cekic, Semra Akkaya Turhan

Department of Ophthalmology, Marmara University Medical School, Istanbul, Turkey

Introduction: Mydriasis is one the side effects of topical and oral corticosteroids. This study was performed to determine whether the intravitreal slow-release dexamethasone implant cause anisocoria.

Methods or Study Design: Seventeen eyes of 17 patients with non-ischemic retinal vein occlusion that underwent intravitreal injection of 0.7 mg dexamethasone implant were included. All eyes had normal light reflex before and after injection. Pupil diameter was measured with the pupillometer under scotopic, mesopic and photopic conditions at baseline and at 1, 4, 8 and 12 weeks of post-injection.

Results: Injected and non-injected fellow eyes had similar baseline pupil sizes under scotopic ($p = 0.48$), mesopic ($p = 0.66$) and photopic conditions ($p = 0.97$, Mann-Whitney U test). Baseline median pupil diameters of injected eyes under scotopic (4.6 mm), mesopic (2.9 mm) and photopic (2.1 mm) conditions did not differ throughout 12 weeks of post-injection (5.0 mm, 3.2 mm, 2.1 mm, respectively) ($p = 0.79$, $p = 0.61$, $p = 0.23$, Wilcoxon signed-rank test). Neither was there any anisocoria when pupil sizes of injected eyes compared to those of fellow eyes (4.6 mm, 3.2 mm, 2.1 mm, respectively) at the last follow-up ($p = 0.12$, $p = 0.56$, $p = 0.56$, Mann-Whitney U test).

Conclusions: Sustained-release dexamethasone intravitreal implant did not induce significant alteration in pupil size even in its peak vitreous concentrations around two months after injection.

Acknowledgements: No financial interest.

Supported by 'Marmara University, Scientific Research Projects Committee'.

Keywords: Anisocoria, Dexamethasone Implant, Intravitreal Injection, Pupil Size.

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Short Term Results of Combined Intravitreal Dexamethasone Implant and Ranibizumab Therapy in Patients with Treatment Naive Retinal Vein Occlusion

Recep Göktug Seymenoglu, Saban Kiliç, Esin Baser

Celal Bayar University Department of Ophthalmology, Manisa, Turkey

Introduction: The purpose of the study is to evaluate the efficacy of combined intravitreal dexamethasone implant (IVDI) and ranibizumab for macular edema in patients with treatment naive retinal vein occlusion (RVO).

Methods or Study Design: 19 eyes of 18 patients with macular edema secondary to retinal vein occlusion were included in this prospective study. 4 eyes had central RVO while 15 eyes had branch RVO. All eyes were treatment naive. Patients included had central macular thickness (CMT) of $\geq 300 \mu\text{m}$ measured by optical coherence tomography for less than six months and visual acuity of less than 20/40. Patients underwent a single injection of intravitreal dexamethasone implant (IVDI) and followed up monthly for 6 months. Primary outcome measures were best corrected visual acuity (BCVA), intraocular pressure (IOP), and CMT.

Results: At baseline; mean BCVA was 1.10 ± 0.58 LogMAR, mean CMT was $607.3 \pm 230.4 \mu\text{m}$, and mean IOP was 15.7 ± 3.7 mm Hg. Mean BCVA improved to 0.78 ± 0.61 ($p = 0.002$) logMAR and mean CMT decreased to $306.1 \pm 162.3 \mu\text{m}$ ($p = 0$) after the 3rd month respectively. Additional treatment was administered to patients with a loss of five or more ETDRS letters and/or $100 \mu\text{m}$ or more increase in CMT during follow up. For this reason, 4 eyes at the end of 3 months, 2 eyes at the end of 4 months and 3 eyes at the end of 5 months received additional intravitreal ranibizumab. Mean BCVA improved to 0.65 ± 0.56 ($p = 0.005$) LogMAR and mean CMT did decrease to $315.6 \pm 189.4 \mu\text{m}$ ($p = 0.001$) at 6th months after additional treatment. IOP increased significantly at months 1 and 2, then came back to baseline levels.

Conclusions: IVDI produced significant improvements at the first three months in treatment naive patients with macular edema secondary to RVO and may be offered as alternative choice of treatment. However, additional treatment with intravitreal ranibizumab became necessary in order to sustain this improvement, after third month.

Acknowledgements: The authors thank Dr. Beyhan Özyurt, for her assistance with statistical analysis.

Keywords: Anti-vascular Endothelial Growth Factor, Combination Therapy, Dexamethasone, Ranibizumab, Retinal Vein Occlusion.

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Large-Scale Retinal Protein Changes Following Experimental Branch Retinal Vein Occlusion and Intervention with Ranibizumab

Lasse Jørgensen Cehofski¹, Anders Kruse¹, Sigríður Olga Magnúsdóttir², Allan Stensballe³, Bent Honoré⁴, Henrik Vorum¹

¹Department of Ophthalmology, Aalborg University Hospital, Aalborg, Denmark; ²Biomedical Research Laboratory, Aalborg University Hospital, Aalborg, Denmark; ³Department of Health Science and Technology, Aalborg University, Aalborg, Denmark; ⁴Department of Biomedicine, Aarhus University, Aarhus, Denmark

Introduction: Studying large-scale protein changes in the retina following BRVO may provide new insights into the biological processes that occur in the retina and identify new potential pharmaceutical targets. These protein changes can effectively be studied with proteomic technologies. The main objective of the present study was to identify retinal protein changes following BRVO and intervention with Ranibizumab using proteomic technologies.

Methods or Study Design: In four Danish Landrace pigs experimental BRVO was induced with argon laser and indirect ophthalmoscopy by applying laser burns on an inferior branch vein until stagnation of the venous blood flow appeared (permission no. 2013-15-2934-00775). After 24 hours all animals received an intravitreal injection of 0.5 ml Ranibizumab in the right eye whilst all left eyes received an intravitreal injection of 0.5 ml saline water. Four days after experimental BRVO the eyes were enucleated and the retinas were prepared for protein analysis by mass spectrometry using filter-aided sample preparation. Mass spectrometry data were searched against a pig protein database optimized from UniProt using the MaxQuant search engine.

Results: Statistic analysis by paired t-test revealed a significant upregulation of 7 proteins whilst 56 proteins were significantly downregulated. Significantly upregulated proteins included platelet-activating factor acetylhydrolase IB subunit alpha. Significantly downregulated proteins included integrin beta 1, protein arginine N-methyltransferase 5, programmed cell death protein 5, nidogen-2 and lipocalin-7. Downregulated biological processes included gene expression, RNA splicing and nuclear mRNA splicing.

Conclusions: We earlier identified an upregulation of nidogen-2, lipocalin-7 and integrin beta-1 in a model of experimental BRVO. These proteins were downregulated in the present study suggesting that the expression of the proteins was reversed by Ranibizumab.

Acknowledgements: This study was supported by the Svend Andersen Foundation, the Bagger-Sørensen Foundation, the Obel Family Foundation, the Herta Christensen Foundation and the North Denmark Region.

Keywords: Branch Retinal Vein Occlusion, Biological Marker, Ranibizumab, Proteomics, Mass Spectrometry.

Impact of Vitreomacular Interface Disorders in the Treatment of Macular Edema Secondary to Retinal Vein Occlusion

Ana Cabugueira, Bárbara Borges, Vanessa Lemos, Manuel Noronha, Ana Amaral, Rita Flores

Centro Hospitalar Lisboa Central, Lisboa, Portugal

Introduction: The purpose of our study was to investigate the influence of macular interface on functional and structural outcome in patients with macular edema secondary to retinal vein occlusion treated with antivascular endothelial growth factor therapeutic (anti-VEGF).

Methods or Study Design: Retrospective and non-randomized study. Complete ophthalmologic examination, fluoresce angiography and optical coherence tomography (OCT) were performed in 21 patients (21 eyes) with macular edema due branch and central retinal vein occlusion. In our sample, vitreomacular interface changes were analyzed by OCT. All patients was submitted to intravitreal anti-VEGF injection (bevacizumab and ranibizumab) treatment.

Results: 29% were male and 71% were female, with mean age 71.9 ± 13.3 . 67% have branch retinal vein occlusion and 28% central retinal vein occlusion. The mean number of intravitreal injections was 3 ± 1.5 . The functional and structural outcome were inferior in the patients with vitreomacular interface changes ($p < 0.05$).

Conclusions: Vitreomacular interface disorders, such as epiretinal membrane and vitreomacular adhesion, could reduce anti-VEGF efficacy and therefore influence visual acuity and structural outcome.

Acknowledgements: Centro Hospitalar Lisboa Central.

Intra-Vitreous Injection of Ranibizumab as a Treatment for Macular Edema Secondary to Branch Retinal Vein Occlusion (BRVO)

Amr Abdel-Fattah Gab-Alla

Faculty of Medicine, Suez Canal University, Ismailia, Egypt

Introduction: To evaluate the short-term effects of intra-vitreous ranibizumab injection on macular edema secondary to branch retinal vein occlusion.

Methods or Study Design: Prospective, interventional study, in this trial, 18 eyes of 18 patients with macular edema secondary to branch retinal vein occlusion (BRVO) were received intra-vitreous ranibizumab (0.5 mg/0.05 ml) injection once diagnosed. Central macular thickness (CMT) at diagnosis and 4 weeks after injections was evaluated by optovue OCT.

Results: There were 18 eyes of 18 patients with BRVO, mean age 56.6 ± 11 years, 66% male & 33.3% female. Mean pre-injection central macular thickness $570.3 \pm 132.9 \mu\text{m}$. At 4 weeks of follow-up, the mean of central macular thickness decreased to $271.7 \pm 62.1 \mu\text{m}$ ($p = 0.001$) using once intra-vitreous injection of 0.5 mg ranibizumab.

Recurrence of macular edema was 11% of the treated cases at mean 4 weeks Follow up period. No complications or serious side effects were observed.

Conclusions: Intra-vitreous injection of ranibizumab to treat macular edema secondary to branch retinal vein occlusion has a significant effects and safe.

Acknowledgements: To my family.

Keywords: Branch Vein Occlusion, Intra-Vitreous Injection, Ranibizumab.

Sequential Bilateral Central Retinal Vein Occlusions in a Patient with Renal Cell Cancer: Good Response to Ranibizumab in a VEGF Secreting Tumour

Murat Kucukercilioğlu, Seckin Aykas, Dorukcan Akincioglu, Emin Aktan

Gulhane Military Medical School, Department of Ophthalmology, Ankara, Turkey

Introduction: Renal cell cancer (RCC) is known as a vascular endothelial growth factor (VEGF) secreting tumor which is one of the targeted molecular pathway in the treatment. Bevacizumab, which is commonly used in several eye diseases, has been studied for the treatment of this cancer. Moreover, it is a pro-thrombotic disease that may cause life threatening thrombotic conditions. We have encountered only one report describing a patient with RCC developed bilateral central retinal vein occlusion (CRVO) treated with ablative therapy only (laser in both eyes and cryotherapy in one eye), and no specific therapy was given for macular edema. We herein want to present a case with RCC developed bilateral CRVO (one week apart), and good response to 1 Ranibizumab (RNB) injection in macular edema.

Methods or Study Design: Case report with fluorescein angiography (FA) and optical coherence tomography (OCT) documentation.

Results: A 43-year old male patient with RCC under treatment with Pazopanib (tyrosine kinase/VEGF inhibitor) presented with CRVO in the right eye. One week later CRVO occurred in the left eye. Visual acuity was counting finger at 1-meter in both eyes. FA confirmed vein occlusions. OCT showed cystoid macular edema and sub-foveal serous retinal detachments on both eyes. Each eye received 1 RNB injection which resulted in complete resolution of macular edema and visual improvement to 0.3 in both eyes at 1-month follow-up. No injection related complication was observed.

Conclusions: RCC patients should be monitored closely for retinal vein occlusions. Good response to 1 Ranibizumab injection may be related with the high VEGF load in this cancer. Anti-VEGF agents may be considered as a good treatment option for macular edema secondary to retinal vein occlusions in patients with RCC.

Acknowledgements: None.

Keywords: Bilateral, Central Retinal Vein Occlusion, Ranibizumab, Renal Cell Cancer.

Comparison of Dexamethasone Intravitreal Implant and Dexamethasone Intravitreal Implant and Early Grid Laser Combination in Patients with Macular Edema Secondary to Branch Retinal Vein Occlusion

Mustafa Güzey, Fatih Mehmet Adibelli, Evren Güler

Harran University School of Medicine Department of Ophthalmology-Retina, Sanliurfa, Turkey

Introduction: For many years, ophthalmologists had few options for treating patients with retinal vein occlusion and macular edema other than laser and observation. But in recent years, the advents of the use of steroids inside the eye have changed that. Currently, anti-VEGF drugs appear to be the most frequently chosen treatment option, but steroids are arguably a good choice in many circumstances. Many ophthalmologists are using them both, either sequentially or simultaneously, and laser photocoagulation is still part of the equation. To compare the efficacy of Dexamethasone Intravitreal Implant (DII) versus combined DII and early Grid Laser Photocoagulation (GLP) in patients with Cystoid Macular Edema (CME) and Branch Retinal Vein Occlusion (BRVO).

Methods or Study Design: In a prospective, comparative effectiveness, single-centre clinical trial, 34 eyes with Macular Edema Secondary to BRVO were randomized to 2 study groups (17 eyes per study group). DII sustained-release dexamethasone 0.7 mg intravitreal implant (Ozurdex®; Allergan, Inc., Irvine, CA) was administered at baseline in both groups and 2 weeks later macular GLP was done in combined treatment group. The Central Macular Thickness (CMT) recorded with Spectral-Domain Optical Coherence Tomography (SD-OCT; Spectralis®, Heidelberg Engineering) was evaluated at baseline and 2 months after the treatment onset.

Results: In DII group baseline and post-treatment CMT values were $517.2 \pm 148.4 \mu\text{m}$ and $309.8 \pm 114.1 \mu\text{m}$ respectively ($p < 0.001$). In DII&GLP treatment group baseline and post-treatment CMT values were $496.7 \pm 165.6 \mu\text{m}$ and $273.4 \pm 96.7 \mu\text{m}$ respectively ($p < 0.001$). There were statistically significant difference between the study groups post-treatment CMT values ($p < 0.01$).

Conclusions: DII or DII&GLP brought about significant CME reduction in patients with BRVO. But short term results of the DII&GLP combined treatment seem to be more favorable and may be considered as an alternative in the treatment of CME with BRVO. Further study is needed to assess the long term efficacy, safety and retreatment.

Acknowledgements: None.

Keywords: Dexamethasone Intravitreal Implant, Grid Laser, Branch Retinal Vein Occlusion, Macular Edema.

Visual Rehabilitation

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Okuvision Therapy in Optic Neuropathies

Umur A. Kayabasi

World Eye Hospital, Istanbul, Turkey

Introduction: Okuvision is an accepted treatment modality in retinitis pigmentosa. There are ongoing clinical trials on this therapy in non-arteritic anterior ischemic optic neuropathy and traumatic optic neuropathy. In retinitis pigmentosa, okuvision is performed weekly for about six months.

Another group is using a different device and doing therapies in optic nerve diseases including glaucoma in 10 consecutive days by using lid electrodes instead of transcorneal stimulation. This therapy is also approved in Europe.

Methods or Study Design: Okuvision therapy was performed in 20 non-arteritic anterior ischemic optic neuropathy and 10 traumatic optic neuropathy patients. The stimulations were performed at least 2 months after the initial visual loss. Transcorneal stimulations were done for 40 minutes per day in 10 consecutive days. The phosphene threshold was detected in each patient and %200 of this level was applied. The damaged optic nerves were examined by OCTrnl before and after the stimulations and computerized visual field exams were also performed.

No side effect was detected.

Results: In 4 patients with anterior ischemic optic neuropathy, visual acuity improvement more than 3 Snellen lines was observed. In 10 patients improvement in visual acuity was between 1 and 3 Snellen lines. 6 patients were stable, but reported increase in brightness and color sensations. Ishihara color plate examination revealed more than 2 plates improvement in 3 of these patients. Visual field examination disclosed minor change in 2 patients.

In traumatic optic neuropathy group, visual acuity improvement more than 3 Snellen lines was achieved in 3 patients. In 4 patients improvement was between 1 and 3 lines. In the other 3 patients, no change was observed. Visual field expansion more than 10 degrees was detected in 4 patients.

Since the therapy was performed at least 2 months later, these improvements could be attributed to the stimulations.

Conclusions: Okuvision may be a safe therapy in certain optic neuropathies.

Acknowledgements: None.

Keywords: Okuvision, Anterior Ischemic Optic Neuropathy, Traumatic Optic Neuropathy.

Visual Rehabilitation with Pattern Biofeedback, Target Biofeedback and Tradizional Exercises: Comparing Three Methods

Raffaele Migliorini, Romualdo Malagola, Alessandro Segnalini, Manuela Fratipietro, Loredana Arrico

University Sapienza Department of Ophthalmology, Rome, Italy

Introduction: The present investigation compares the effectiveness of three visual rehabilitation methods in patients with central scotoma. One group underwent standard rehabilitation, with exercises, and two groups received modern rehabilitation with biofeedback, using two different stimulus presentation methods: in one group the stimulus was structured, represented by a flickering pattern, while in the other group a simple target stimulus was used. We want to evaluate, by comparing the pre and post rehabilitation assessments, the actual effectiveness of these methods in improving visual performance of patients.

Methods or Study Design: 45 randomly selected patients affected by AMD, with visual acuity between 0.4 and 1.3 logMAR(4/10-1/20) and absolute central scotoma. All patients underwent: Distance visual acuity (in logMAR), Reading near visual acuity, Contrast sensitivity (Pelli-Robson), Reading speed, Retinal Fixation measured with Microperimeter (MP1) so how the Retinal Sensivity expressed in dB. For the evaluation of fixation stability three different classification methods were considered.: 1 The MP1 classification, 2 Fujii et al. (2002) and Sawa (2006), 3 Steinman method. Average and standard deviation ($\pm$ SD) of the samples were calculated. The paired Student t test for paired samples was used to detect changes in the data of evaluations obtained before and after the rehabilitation treatment. P values <0.05 were considered statistically significant.

Results: The initial distance visual acuity showed statistically significant differences ($p < 0.01$) between the group rehabilitated with exercises and the groups rehabilitated with biofeedback: Standard rehabilitation exercises: 0.63 logMAR (almost 2.5/10); Rehabilitation with biofeedback standard: 0.89 LogMAR (slightly more than 1.25/10); Rehabilitation with biofeedback via structured stimuli: 0.81 logMAR (less than 1.25/10).

Conclusions: The most exciting improvement was definitely that found in the group that underwent biofeedback rehabilitation with flickering pattern stimulation. The fixation appears consistently stabilized, ensuring the patient with a better visual performance.

Acknowledgements: The Authors have no financial interest in any of the products mentioned in the manuscript.

Keywords: Visual Rehabilitation, Microperimetry, Biofeedback, AMD.

Vitreoretinal Surgery

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Clinical Characteristics and Surgical Outcomes of Pediatric Rhegmatogenous Retinal Detachment

Bulent Gurler¹, Erol Coskun², Veysi Oner³, Aysegul Comez⁴, Ibrahim Erbagci²

¹Fatih University, Istanbul, Turkey; ²Gaziantep University, Gaziantep, Turkey; ³Recep Tayyip Erdogan University, Rize, Turkey; ⁴Gaziantep Children State Hospital, Gaziantep, Turkey

Introduction: In this study we analyzed the characteristics and surgical results of pediatric rhegmatogenous retinal detachment (RRD).

Methods or Study Design: The medical records of 23 (+7) eyes of (+7) 22 patients younger than 18 years of age who underwent vitreoretinal surgery due to RRD were analyzed. The gender, age, laterality, duration of presenting symptom, etiology, ocular and systemic co-morbidities, type of breaks, lens status, presence of proliferative vitreoretinopathy (PVR) and its grade, initial and final best-corrected visual acuities, surgical management, number of operations, duration of follow up, functional and anatomical success, and complications were noted.

Results: The mean age was 12.9 ± 1.2 years. There were 23 male (76.7%) and 7 female (23.3%) subjects. The most common etiological factors were high myopia (40%) and trauma (36.6%). The most common type of retinal break was flap tear ($n = 22$, 73.3%). PVR grade C was present in 16.6% of eyes ($n = 5$). The most common primary surgery was pars plana vitrectomy ($n = 19$, 63.3%). Twenty-five eyes (83.3%) were treated with only one surgical procedure, whereas 5 eyes (16.7%) underwent the secondary operations. Anatomical success was achieved in 24 eyes (80%) after the primary surgeries and in 25 eyes (83.3%) after the secondary surgeries. Functional success rate was 70% ($n = 21$) after the primary surgeries and was 80% ($n = 24$) after the secondary surgeries.

Conclusions: Myopia and trauma were the most common etiological factors related to RRD in pediatric population. In spite of the difficulties in the diagnosis and treatment of pediatric RRD, high anatomic and functional success rates could be achieved.

Acknowledgements: None.

Keywords: Children, Rhegmatogenous Retinal Detachment, Vitrectomy.

Internal Limiting Membrane Surgery for Large Macular Hole Closure

Iurii Alexandrovich Belyi, Alexander Vladimirovich Tereschenko, Dmitriy Olegovich Shkvorchenko, Yulia Alexandrovna Sidorova

Eye Microsurgery Kaluga Branch, Kaluga, Russia

Introduction: The search for new surgical methods of internal limiting membrane (ILM) surgery for macular hole closure is important today. We aimed to develop a 'step by step' technique of ILM fragment formation for macular hole closure.

Methods or Study Design: 9 patients (9 eyes) with large macular holes (more than 400 µm in diameter). Visual acuity with correction before the treatment ranged from 0.05 to 0.3 decimals.

The highlight of the new technique are 'step by step' stages of the formation and removal of the ILM fragments leaving intact the area around the macular hole, and the formation of fragment of ILM and its turning to close macular hole. The operation also includes such standard manipulations as vitrectomy, removal of PHM, and ILM staining. Furthermore, introduction of PFOS, 1.5–2 ml, is performed followed by the replacement of the fluid and PFOS into the air and drying of the retina. The completion of the operation is made by introducing SF6 gas.

Results: No complications were observed during surgery and within 3 months follow-up. 3 months after the operation the structure of the retina was preserved, the fragment of ILM was on the surface of the retina, the outer limiting membrane had a linear profile all along, the defect at the outer segments of photoreceptors was not detected in all 9 patients. Central light sensitivity increased from 18.2 to 23.6 dB; the fixation point displaced to the center of the fovea on 1.46 degrees (438 µm); the overall light sensitivity increased from 23.8 to 25.6 dB. Final visual acuity with correction ranged from 0.3 to 0.7 decimals.

Conclusions: The technique allows to form the prescribed sized fragment of ILM under control, to close macular holes any size, and to save the newly formed fixation point.

Acknowledgements: None.

Keywords: Internal Limiting Membrane, Macular Hole, Macular Surgery.

A Comparison of 23-Gauge and 20-Gauge Vitrectomy Surgery for Proliferative Sickle Cell Retinopathy – Clinical Outcomes and Surgical Management

Anna Grabowska, Jason Ho, Mahi Muqit

Moorfields Eye Hospital, London, United Kingdom

Introduction: Patients with sickle cell retinopathy (SCR) may require surgical intervention for fovea-threatening/involving tractional retinal detachment (TRD) or non-resolving vitreous haemorrhage (VH). We analyse the surgical management and clinical outcomes in a large cohort of SCR patients who underwent 20-gauge and 23-gauge vitrectomy over a 6-year period.

Methods or Study Design: Retrospective consecutive case series of 72 eyes from 64 patients who underwent vitreoretinal intervention for complications of SCR between 2008–2014 at Moorfields Eye Hospital, London, UK. Statistical analysis was performed with GraphPad Prism v6, all results are paired t-tests unless stated otherwise.

Results: 35 male and 29 female patients presented with a mean age of 42 years, 72 eyes. 62 cases were HbSC heterozygotes vs 7 HbSS homozygotes and 3 HbAS (sickle trait) or HbSF (sickle/fetal). The indications for surgery included: TRD (25); VH (19); VH with TRD +/- rhegmatogenous retinal detachment (RRD) (11); macular hole (MH)/Epiretinal Membrane (ERM) (11); VH and ERM/MH (3); and, RRD (3).

39 and 33 cases underwent 20-Gauge and 23-Gauge vitrectomy, respectively. The median follow-up period was 14 months. At the final follow-up, 63 eyes (94%) had retinal re-attachment without tamponade, 33/39 (85%) in the 20-Gauge and 30/33 (91%) in the 23-Gauge group ($p = 0.49$).

Overall, mean best corrected visual acuity (BCVA) improved from a pre-operative 1.28 LogMAR to final BCVA of 0.74 LogMAR ($p = 0.000$). 23-Gauge group yielded a 6-line BCVA improvement compared to 5-line improvement with 20-Gauge ($p = 0.69$), and showed a lower rate of per-operative complications (18% vs 30%, $p = 0.279$). The subset of 38 eyes with TRD/RRD demonstrated a BCVA improvement of 3 lines ($p = 0.087$).

Conclusions: Timely intervention for complicated SCR may be highly successful for retinal re-attachment. The degree of visual improvement is guarded in patients with TRD/RRR detachments. 23-Gauge vitrectomy is associated with satisfactory visual outcomes and lower per-operative complication rates compared to 20-Gauge surgery.

Acknowledgements: Catherine Egan, Moorfields Eye Hospital; Marta Ugarte, Moorfields Eye Hospital.

Acknowledgements: None.

Keywords: Sickle Cell, Retinopathy, Vitrectomy.

Surgical Treatment of Macular Holes – 24-Month Follow-Up

Adam Klus, Mariusz Kosatka, Michal Patyk, Milena Kozera, Marek Rekas

Military Institute of Medicine, Warsaw, Poland

Introduction: Evaluation of the results of macular holes surgery with inverted ILM flap and SF6 gas endotamponade.

Methods or Study Design: Material and methods: In a retrospective study there were evaluated the results of the treatment of patients with stage II-IV macular holes acc. to Gass. In all cases posterior 25 G vitrectomy was performed with inverted ILM flap and SF6 gas endotamponade. Additionally, phacoemulsification was performed and artificial lens was implanted in patients with coexisting cataract. The best distance corrected visual acuity (CDVA) acc. to Snellen, intraocular pressure (IOP) and anterior and posterior segment of the eye were evaluated to assess the occurring complications. Ophthalmological examination was performed preoperatively and 1 and 7 days and then 1, 6, 12 and 18 months after the surgery.

Results: There occurred different types of hole closure, such as U, V and W. A statistically significant improvement of the mean CDVA ($p < 0.05$) was observed in the whole group. No statistically significant differences were found in IOP pre- and postoperatively ($p > 0.05$).

Conclusions: Posterior 25G vitrectomy with inverted ILM flap and SF6 gas endotamponade performed in the case of macular holes improves visual acuity. Profile of the observed complications shows that vision-threatening consequences involve a small group of patients.

Acknowledgements: In addition, a thank you to Professor M. Rekas, who introduced us to the Methodology of work, and whose passion for the 'underlying structures' had lasting effect.

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Complex Retinal Detachment Repair: Outcomes of Silicone Oil Tamponade in Cork University Hospital 2010–2014

Terence Mc Swiney, Niamh Collins, Anthony Cullinane

Cork University Hospital, Cork, Ireland

Introduction: Complex retinal detachment repair remains a challenging area in vitreoretinal surgery. The use of silicone oil (S.O.) can improve the prognosis of complex retinal detachment, however is associated with complications, hence removal of S.O. is generally recommended. We evaluated the outcomes of complex retinal detachment repair with S.O. tamponade, in terms of anatomical success, visual acuity and complications.

Methods or Study Design: Retrospective review of all cases of silicone oil tamponade for retinal detachment repair in Cork University Hospital over 4 years (2010 – 2014) operated by one surgeon. We analysed 23 consecutive cases of S.O. tamponade (21 patients – 1 bilateral). One thousand centristroke silicone oil tamponade was used in each case. Three patients had previous retinal detachment repair with SF6 gas tamponade. Fifteen eyes underwent silicone oil removal. Median duration of S.O. tamponade among these 15 cases was 5.5 months; median duration of follow-up after S.O. removal was 11.5 months.

Results: Anatomical success after S.O. insertion was achieved in 22 of 23 cases (20 patients). Of these, S.O. was removed in 15 cases and was left in situ in 7 cases. Two eyes redetached under S.O. tamponade within 2 months of the initial S.O. insertion and had a second procedure with S.O. tamponade. At last follow-up, 14 cases remained attached following S.O. removal, 1 eye re-detached within 6 months of S.O. removal, 7 eyes remained attached under S.O. tamponade (including the two early redetachments). Visual acuity improved or remained stable post removal of S.O. in all 10 cases (median visual acuity 6/36). Complications included uncontrolled IOP in 3 eyes – one required trabeculectomy.

Conclusions: While reattachment and complication rates are similar to other studies, the majority of patients in this small series with complex retinal detachments achieved relatively good visual outcomes. The rate of redetachment following S.O. tamponade was low.

Acknowledgements: Ophthalmology Theatre Staff, Cork University Hospital.

Keywords: Retinal Detachment, Silicone Oil, Outcome.

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Indications and Outcomes for Sclera Tunnel Fixed Secondary Intra-Ocular Lenses: Single Centre Series

Fatemeh Shams, Zachariah Koshy

University Hospital, Ayr, United Kingdom

Introduction: Insertion of sclera fixated posterior chamber intraocular lenses (PCIOL) allows lens implantation in the absence of adequate lens capsule support. We evaluate our experience with a 3 piece IOL fixed through scleral tunnels.

Methods or Study Design: Scleral fixed PCIOLs performed at University Hospital, Ayr, Scotland. A single surgeon series in a teaching hospital.

Methods: Retrospective review of case notes of 18 eyes over a 2-year period (January 2013–April 2015).

Results: Indications for secondary IOL insertion: 2 subluxed crystalline lenses from Marfan syndrome, 4 aphakia secondary to trauma both perforating and blunt, 1 dislocated crystalline lens, 4 aphakia secondary to complicated phacoemulsification surgery, 7 subluxed lens capsular bag complex.

38% of eyes had improved best-corrected visual acuity (BCVA) postoperatively, 27% remained the same and 22% worsened.

3 cases were found to have a mild postoperative PCIOL tilt, which had no visual implications. 2 developed postoperative retinal detachments (RD), which were subsequently fixed. 1 developed a suprachoroidal haemorrhage following post-operative trauma. 1 developed postoperative cystoid macula oedema that resolved with medical management. 1 developed a dislocation of the IOL.

Conclusions: Our experience shows that insertion of scleral fixated PCIOLs is a viable method of secondary IOL insertion in multiple scenarios where lens capsular support is lacking. It is recommended that it be done with vitreoretinal back up due to potential complications.

Acknowledgements: None.

Keywords: Intraocular Lens, Fixed, Sclera, Secondary.

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Temporary Silicone Encircling Band in Retinal Detachment Scleral Surgery

Romualdo Malagola, Luigi Pattavina, Carmela Carnevale, Loredana Arrico

University Sapienza Department of Ophthalmology, Rome, Italy

Introduction: Two main purpose of this study were to assess the validity of a silicone band that is closed with absorbable thread instead of traditionally not-absorbable one and to estimate the changes in refraction and axial length after this surgery.

Methods or Study Design: 8 patients (8 eyes) with rhegmatogenous retinal detachment were enrolled. All patients underwent a comprehensive ophthalmologic examination including high contrast Snellen visual acuity measurement, slit lamp biomicroscopy, Goldmann applanation tonometry, A-Scan biometry and dilated

fundus examination with indirect ophthalmoscopy. Examination took place pre-operatively (T0), every 7 days during the first month (T1) and every 15 days during the second one (T2). Surgery was carried out performing indentation with an elastic silicone band 2.5 mm wide, associated with silicone scleral buckling. The ends of the band were joined together by a knot tied with an absorbable polyglactin 910 thread (Vicryl 6/0).

Results: Post surgery mean axial length was 0.58 mm (maximum 0.92; minimum 0.27 mm) at T1 and 0.50 mm (maximum 0.77 mm; minimum 0.31 mm) at T2 while mean myopization was equal to -2.10 D (maximum -3.50D; minimum -1 D) at T1 with mean modification of the refraction of + 1.50D (maximum +3D; minimum +1D) at T2. A comparison between T0 and T2 showed that the change in axial length was on the average + 0.07 mm (maximum +0.30 mm; minimum -0.03 mm) with mean myopization equal to -0.125D (maximum +1D; minimum -1D).

Conclusions: Changes in refraction that occur after surgery are transitory. 60 days postoperatively, refraction and axial length of the eyes changes, as compared to preoperative values, and they were less if compared to surgery in which closing of the scleral buckling was carried out with not absorbable thread.

Acknowledgements: The Authors have no financial interest in any of the products mentioned in the manuscript.

Keywords: Retinal Detachment Surgery, Scleral Buckling, Refraction, Axial Length.

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Scleral Drainage of Subretinal Fluid in Retinal Detachment Surgery

Romualdo Malagola¹, Luigi Pannarale², Chiara Komaiha¹, Loredana Arrico¹

¹University Department of Ophthalmology Sapienza, Rome, Italy; ²University Department of Anatomy Sapienza, Rome, Italy

Introduction: We report the surgical outcomes of a single series of patients who received scleral surgery for primary retinal detachment using a modified sclerotomy for the drainage of the subretinal fluid.

Methods or Study Design: One hundred-twenty eyes of patients with primary retinal detachment underwent scleral buckle placement with modified sclerotomy for drainage of the subretinal fluid. A scleral pocket parallel to corneal limbus and positioned behind the scleral buckle was executed. Postoperative and surgical data were collected.

Results: The subretinal fluid was successfully drained in all eyes. The reattachment rate was 95%. In 90% of cases one single sclerotomy was necessary, in 10% two consecutive scleral pockets in different sites were performed. Intraoperatively, subretinal haemorrhage occurred in 2.5% of eyes and controlled choroidal detachment in 0.8%. At the drainage site no retinal holes or vitreoretinal incarceration were recorded.

Conclusions: This modified sclerotomy drainage technique appears a useful, effective and safe method to drain the subretinal fluid. The high retinal reattachment rate and the low complication rate suggest that this technique may represent a valuable alternative to other subretinal fluid drainage procedures.

Acknowledgements: The Authors have no financial interest in any of the products mentioned in the manuscript.

Keywords: Drainage of Subretinal Fluid, Retinal Detachment Surgery, Sclerotomy.

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Rhegmatogenous Retinal Detachment Surgery: Complications and Its Risk Factors

Vanessa Lemos, Ana Cabugueira, Arnaldo Santos, Luisa Vieira, Ana Amaral, Nuno Marques, João Branco

CHLC, Lisboa, Portugal

Introduction: Despite the evolution of the instruments, complications continue to be part of vitreoretinal surgery.

Purpose: To evaluate functional and structural outcome of patients undergoing Rhegmatogenous Retinal Detachment (RRD) surgery and its complications. And to identify risk factors for these complications.

Methods or Study Design: A retrospective study of 96 eyes with RRD that underwent pars plana vitrectomy, Laser and/or cryotherapy and tamponade with/without scleral indentation. Best corrected visual acuity (BCVA) was assessed with Snellen chart and converted to logMAR. We also analyzed the following parameters: age, gender, history of glaucoma, diabetes mellitus, high myopia (>6D), pre and post operative intraocular pressure and medication, postoperative complications and previous ophthalmic surgery.

Results: Surgical mean age was 59.6 ± 16.1 years, 64.6% were male. Mean postoperative follow-up of 18.4 ± 6.5 months. There was a significant improvement in mean postoperative BCVA 0.52 ± 0.52 . Postoperatively, eyes with macula on (0.4 ± 0.52) showed a significantly higher BCVA than with macula off (-0.41 ± -0.38). Postoperative complications were recorded: cataract (50%), increased intraocular pressure (44.7%) redetachment (19.8%), epiretinal membrane (13.5%), cystoid macular edema (3.1%), macular hole (3.1%) and subretinal fluid (2.1%). 87.5% of the eyes that developed cataract underwent Laser, 33.3% cryotherapy, 66.7% scleral buckle, 58.3% SF6, 4.2% C3F8, and 33.3% silicone oil. Approximately 32% of eyes with SF6 and 67% with silicone experienced an increase in intraocular pressure ($p < 0.05$). It was found that development of epiretinal membrane was more frequent in patients older than 60 years (61.5%). The factor with significant correlation with retinal redetachment was postoperative follow-up time. In the cystoid macular edema subgroup, stands out pseudophakia ($p < 0.05$).

Conclusions: In conclusion, we highlight the importance of evaluating the functional and structural components of the preoperative RRD, since they have an important role in predicting the surgical success, as well as timely follow-up of these patients to prevent, diagnose and treat its complications.

Acknowledgements: None.

Keywords: Rhegmatogenous Retinal Detachment, Vitreoretinal Surgery, Complications, Risk Factors.

The Dark Side of Rhegmatogenous Retinal Detachment Surgery – Increased Intraocular Pressure?

Vanessa Lemos, Ana Cabugueira, Joana Cardigos, Ana Amaral, Nuno Marques, João Branco

CHLC, Lisboa, Portugal

Introduction: Transient or permanent increase in intraocular pressure (IOP) is a frequent complication and with multifactorial origin (pre-existing glaucoma, corticosteroid therapy and tamponade type).

Purpose: To determine the underlying cause of IOP elevation after rhegmatogenous retinal detachment (RRD) surgery and risks factors.

Methods or Study Design: A retrospective study of 95 patients were selected with RRD that underwent pars plana vitrectomy, Laser and/or cryotherapy and tamponade with or without scleral indentation. Follow-up postoperative time ≥ 6 months. The best corrected visual acuity (BCVA) was assessed with the Snellen chart and structural success was defined as retinal attached in all four quadrants on funduscopy performed by a senior retinal surgeon. We also analyzed the following parameters: age, gender, history of glaucoma, hypertension, high myopia ($>6D$), functional and structural outcomes, pre and post IOP, pre and postoperative medication and previous ophthalmic surgery.

Results: Surgical mean age of our sample was 59.6 ± 16.1 years, the majority were male (64.6%) with a mean postoperative follow-up of 18.4 ± 6.5 months. There was a significant improvement in the mean postoperative BCVA 0.3 ± 0.3 ($p < 0.05$). The postoperative complications were recorded. IOP elevation was defined as IOP ≥ 21 mm Hg and/or a change from baseline of ≥ 5 mm Hg after surgery.

IOP increased in 44.7% of the sample. Approximately 32% of eyes with SF6 and 67% with silicone experienced an increase in intraocular pressure ($p < 0.05$). 38% of the patients submitted to scleral buckling had increased IOP. The mean number of antiglaucoma drugs increased postoperatively ($p < 0.05$).

Conclusions: In our study, secondary glaucoma, which develops after scleral buckling procedures, or pars plana vitrectomy for repair of rhegmatogenous retinal detachment, is of multifactorial origin. It is essential, for appropriate management, to detect the cause of outflow obstruction. Selecting a less expansive gas and adjusting its concentration might minimize the incidence of this complication.

Acknowledgements: None.

Keywords: Rhegmatogenous Retinal Detachment, Vitreoretinal Surgery, Intraocular Pressure.

Evaluation of Macular Retinal Ganglion Cell Complex and Nerve Fiber Layer after Vitrectomy with Internal Limiting Membrane Peeling for Idiopathic Macular Holes

Figen Sermet, Sibel Demirel, Ahmet Abdullayev, Emin Ozmert

Ankara University Faculty of Medicine, Department of Ophthalmology, Ankara, Turkey

Introduction: The aim of the study was to evaluate macular retinal ganglion cell complex and nerve fiber layer after vitrectomy with internal limiting membrane peeling for idiopathic macular holes using spectral domain optical coherence tomography (SD-OCT).

Methods or Study Design: 18 eyes from 18 patients with idiopathic macular holes who underwent vitrectomy with internal limiting membrane (ILM) peeling were retrospectively analyzed. 18 eyes of 18 healthy people constituted the control group. Patients were evaluated one day, one week, one month and 3 months after surgery. Best corrected visual acuity (BCVA) measurements, color fundus photographs, and fundus autofluorescence images were taken at every visit. Macular retinal ganglion cell-inner plexiform layer (GCIPL) thickness was measured with SD-OCT before surgery and at one month and three months after surgery and compared with control group. Optic nerve fiber layer was evaluated with C-scan mode.

Results: Of the 18 patients, 9 were male and 9 were female with a mean age of 65.6 ± 5.6 years. Preoperative BCVA was 0.75 ± 0.19 logMAR, while it was 0.44 ± 0.17 logMAR and 0.36 ± 0.15 logMAR at postoperative first and third months respectively ($p < 0.001$). Postoperative GCIPL thickness was 66.33 ± 17.28 μ m. There was a correlation between mean GCIPL thickness and BCVA at postoperative third month ($p < 0.01$). When compared with control group, GCIPL thickness was significantly thinner in all quadrants in patients at postoperative third month. There was dissociated optic nerve fiber layer (DONFL) appearance in 13 of 18 eyes postoperatively. There was no correlation between the presence of DONFL and BCVA ($p > 0.05$). All of the holes were closed postoperatively.

Conclusions: ILM peeling during macular hole surgery may cause functional and/or structural changes which can be detected by SD-OCT. There may be significant reduction in GCIPL thickness and DONFL appearance which may or may not be related with visual acuity changes.

Acknowledgements: None of the authors have any proprietary interests or conflicts of interest related to this submission. None of the authors have any financial support.

Keywords: Idiopathic Macular Hole, Internal Limiting Membrane Peeling, Macular Retinal Ganglion Cell Complex, Nerve Fiber Layer.

Long-Term Intraocular Pressure Alterations after Encircling Scleral Buckle Surgery for Rhegmatogenous Retinal Detachment

Osman Cekic, Esra Eyvaz, Fehim Esen

Department of Ophthalmology, Marmara University Medical School, Istanbul, Turkey

Introduction: To evaluate the long-term intraocular pressure (IOP) changes following encircling scleral buckle surgery for rhegmatogenous retinal detachment.

Methods or Study Design: Eleven eyes of 11 patients (3 female, 8 male; median age: 29 years) that underwent successful encircling scleral buckling surgery for rhegmatogenous retinal detachment were retrospectively studied. Ten out of 11 eyes were phakic. There was no previous history of glaucoma in the patients. Preoperative and regular follow-up anterior and posterior segment examinations and IOP measurements were recorded while use of glaucoma medications was tabulated.

Results: Median follow-up time was 9 months. No additional ocular surgery was performed during follow-up. At the last examination, all operated eyes had flat retina. At the last examination, there was no median IOP difference between operated and non-operated fellow eyes (14 mm Hg versus 15 mm Hg, $p = 0.4$). While none of the fellow eyes needed glaucoma medication, five operated eyes (4 phakic and 1 pseudophakic) were on topical antiglaucomatous medication at the final examination.

Conclusions: Previous studies reported narrowing of the trabecular iris angle after scleral buckling surgery. This causes a significant IOP rise within postoperative 48 hours, but this elevation become insignificant at postoperative first week and first month. In our preliminary study, we observed 45% of the operated eyes needed glaucoma medication in the long-term while none of the fellow eyes did.

Acknowledgements: Financial Interest: No.

Keywords: Intraocular Pressure, Long-Term Follow-Up, Retinal Detachment, Scleral Buckle.

Late Visual Recovery after Surgery for Regmatogenous Retinal Detachment

Murat Kucukevcilioglu, Ali Hakan Durukan, Gokhan Ozge, Furkan Senyuz, Dorukcan Akincioglu

Gulhane Military Medical School, Department of Ophthalmology, Ankara, Turkey

Introduction: Visual recovery after retinal detachment surgery may take some time to reach the final vision. However, visual acuity measured in the early postoperative period can give some idea about the final vision that could be attainable in the follow-up. We herein want to present a case demonstrated steady worse vision which improved dramatically 13 months after retinal detachment surgery.

Methods or Study Design: Case report with optical coherence tomography (OCT) of macula and optic nerve, and visual evoked potentials (VEP) findings.

Results: A 58-year old female patient underwent vitrectomy with cataract surgery and membrane peeling for vitreomacular traction syndrome. Two months later she developed regmatogenous retinal detachment which was fixed with silicone oil injection. Under silicone oil with an attached retina vision was always 0.1 (Snellen equivalent) for 4 months until silicone oil removal. After silicone oil removal visual acuity did not change much and was 0.16. OCT showed attached macula with no subretinal fluid. VEP and retinal nerve fiber layer analysis were unrevealing. It was 9 months after silicone oil removal that vision improved to 0.8.

Conclusions: Visual recovery after attaching the retina may take longer in some retinal detachment cases. There may not be any structural or functional findings to explain this entity. However, OCT imaging focusing on inner and outer segments of the photoreceptors may reveal interesting findings.

Acknowledgements: None.

Keywords: Prolonged, Retinal Detachment, Surgery, Visual Recovery.

Silicone Oil Injection and Removal for Regmatogenous Retinal Detachment during Pregnancy

Murat Kucukevcilioglu, Ali Hakan Durukan, Onder Ayyildiz, Dorukcan Akincioglu, Furkan Senyuz

Gulhane Military Medical School, Department of Ophthalmology, Ankara, Turkey

Introduction: There is scarce literature about management of regmatogenous retinal detachment occurring during pregnancy. We encountered 5 cases in the current literature of which 1 underwent scleral buckling at the time of cesarean, and other 4 underwent scleral buckling during pregnancy. Only 1 case received local anesthesia. We herein want to present a regmatogenous retinal detachment in a pregnant woman managed with silicone oil injection and removal under retrobulbar anesthesia during pregnancy.

Methods or Study Design: Case report.

Results: A 25-year old pregnant woman presented with macula involving regmatogenous retinal detachment at 2-month of her pregnancy. We proceeded with vitrectomy with silicone oil injection under retrobulbar anesthesia while she was lying flat on her back, and retina was attached. Silicone oil was removed with the same settings at 7-month of her pregnancy. Final vision was 0.8 (Snellen equivalent). We did not observe any complication related to lying position, type of anesthesia or silicone oil tamponade during surgeries and follow-ups.

Conclusions: Vitrectomy with silicone oil injection can be considered as a safe treatment option for regmatogenous retinal detachments developing during pregnancy.

Acknowledgements: None.

Keywords: Pregnancy, Retinal Detachment, Silicone Oil.

Optic Disc Pit Maculopathy: Total Resolution with Vitrectomy and Internal Limiting Membrane Peel

Minji Jennifer Kim¹, Niall Patton², Simon Kelly¹

¹Royal Bolton Hospital, Bolton, United Kingdom; ²Manchester Royal Eye Hospital, Manchester, United Kingdom

Introduction: Optic disc pits are excavations of the optic nerve head usually associated with other abnormalities of the optic nerve or peripapillary retina. When maculopathy is present it is often in the form of a serous retinal detachment. We present a case of optic disc pit maculopathy where the optic disc pit was associated with a significant intraetinal schitic fluid that was successfully managed with vitrectomy, internal limiting membrane peel and gas tamponade.

Methods or Study Design: 34-year-old gentleman presented with increasing difficulty with distance vision. His vision was 0.30 logMAR and dilated fundal examination revealed a temporal optic disc pit with diffuse macular elevation. Optical coherence tomography imaging illustrated significant peripapillary and perifoveal intraretinal fluid.

Results: The patient underwent vitrectomy, internal limiting membrane (ILM) peel and air tamponade. His vision improved to 0.10 logMAR and the intraretinal schitic changes in the macula began to resolve. At three year follow-up post-operatively, he remains asymptomatic and his vision is excellent at -0.10 logMAR with no recurrence of his intraretinal fluid.

Conclusions: Optic disc pit maculopathy can be an extremely difficult pathology to manage. This case illustrates how vitreoretinal intervention, in the form of vitrectomy, ILM peel and gas tamponade can be successfully utilised to the patient's benefit. This patient had resolution of his symptoms and has excellent visual acuity with no recurrence of the foveal intraretinal fluid. Clinicians should therefore consider vitreoretinal referral in such cases.

Acknowledgements: None.

Keywords: Optic Disc Pit Maculopathy, Vitrectomy, Internal Limiting Membrane Peel.

Macular Hole Formation Following Nd:YAG Laser Hyaloidotomy

Dorukcan Akincioglu, Murat Küçükevcilioglu, Ali Hakan Durukan

Gülhane Military Medical Academy, Ankara, Turkey

Introduction: Miscellaneous vascular and hematologic pathologies may cause hemorrhage at the vitreoretinal interface leading to sudden vision loss. Strict follow-up is a choice for a spontaneous resorption chance though long-standing cases may cause membrane formation with or without traction. Membrane formation is indication for an immediate pars plana vitrectomy. Drainage of entrapped blood into vitreous is also a method in which restoration of central vision within days was reported. Managing submacular hemorrhage by puncturing posterior hyaloid is viable al-

ternative to pars plana vitrectomy. Nd:YAG laser hyaloidotomy complications are usually presented as case studies or case series. Retinal detachment, peripheral retinal breaks and hole formation are rare and serious complications. In this study we aimed to present a patient with hematologic malignancy, developed macular hole following Nd:YAG hyaloidotomy for preretinal hemorrhage.

Methods or Study Design: Complete Ophthalmic and systemic evaluation was performed on a patient who was referred to our clinic for decreased visual acuity in one eye. He was admitted to hematology department for leukocytosis.

Results: A 25 year-old caucasian male patient presented with decreased vision. Best corrected visual acuity was 0.30 (LogMAR) in the right eye and 0 (LogMAR) in the left eye. His anterior segment examination was completely normal. Fundus examination revealed preretinal hemorrhage in the right eye and extramacular small hemorrhagic spots in the left eye. This was thought to related to his hematologic conditions therefore we tended to follow-up with no intervention. On the following day he presented with decreased vision in her both eyes. No resorption was seen in two weeks so Nd:YAG laser hyaloidotomy administered. After the following two days vitreous was clear. One month later macular hole revealed.

Conclusions: We think that small entrapped blood was not enough to protect macula from disruptive effect of laser so one disc diameter is not enough to dampen laser burst.

Acknowledgements: I am grateful for helpful advice and discussions about the manuscript.

Keywords: Hole, Nd:YAG, Preretinal.

Anti-VEGF Agents in Macular Edema after Retinal Surgery

Murat Kucukevcilioglu, Seckin Aykas, Dorukcan Akincioglu, Ali Hakan Durukan

Gulhane Military Medical School, Department of Ophthalmology, Ankara, Turkey

Introduction: Macular edema after cataract surgery is well known. However, macular edema after retinal surgery is quite rare, and knowledge about management strategies is scarce. We herein want to report a case series developed macular edema after retinal surgery for various retinal disorders, and were managed with intraocular injections of anti-VEGFs.

Methods or Study Design: Case series with optical coherence tomography documentation.

Results: We retrospectively reviewed the files of patients developed macular edema after retinal surgery. Some cases responded well to intraocular injections of anti-VEGFs, however, some did not. Cysts in the inner retina seemed to be resistant to anti-VEGF injections.

Conclusions: Anti-VEGFs may be considered as a treatment option for macular edema after retinal surgery. However, further larger studies are needed to confirm this observation.

Acknowledgements: None.

Keywords: Anti-VEGF, Macular Edema, Retinal Surgery.

AMD

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Comparison between Treat and Extend Approach and Pro Re Nata in Exudative Age-Related Macular Degeneration

Verónica Castro-Navarro, Javier Montero-Hernández, Catalina Navarro-Palop, Enrique Cervera-Taulet

Hospital General Universitario de Valencia, Valencia, Valencia, Spain

Introduction: To compare functional and anatomical outcomes of ranibizumab treatment in neovascular age-related macular degeneration (AMD) according to pro re nata (PRN) or treat and extend (TAE) regimens.

Methods or Study Design: Retrospective study. In PRN regimen, patients were seeing monthly and re-treated if vision loss of ≥ 1 line and/or active exudation. TAE protocol consisted once stable visual acuity, and no signs of exudation have been achieved, patients continued to receive regular maintenance injections at increasing intervals. For qualitative and quantitative anatomical analysis, Spectral-domain optical coherence tomography (SD-OCT) B-scans images were obtained and analyzed by a retina specialist. A Wilcoxon-test and Spearman's rank correlation coefficient were used. Statistical significance was defined as P values < 0.05 .

Results: After 17 months, patients included in the TAE ($n = 12$) received a mean of 9 ± 1.3 injections and a mean of 7.83 visits were performed. In contrast, in the PRN ($n = 11$), 7.27 ± 1.8 injections were administered and 11.73 ± 3.4 visits were realized. In the former, best corrected visual acuity (BCVA) at baseline was 0.35 ± 0.25 dec and increased ($p = 0.003$) up to 0.65 ± 0.22 dec. Central macular thickness (CMT) decreased ($p = 0.005$) changing from $348.25 \pm 78.5 \mu$ to $237.08 \pm 24.5 \mu$. In the PRN group our data revealed an improvement in CMT ($337.27 \pm 59.7 \mu$ to $266 \pm 57.5 \mu$; $p = 0.003$), without significant changes in BCVA (0.40 ± 0.21 dec to 0.40 ± 0.26 dec; $p = 0.570$).

Regarding anatomical outcomes, 83.3% of patients belonging to the TAE group showed absence of fluid in the SD-OCT images at the last visit and 91.7% ($n = 11$) had significantly improved their anatomical image. Referring to the PRN group 63.3% of patients remained without active exudation and an anatomical improvement was found in 81.2% ($n = 9$) $p = 0.570$ at deadline.

Conclusions: TAE protocol while maintaining gains in visual acuity, may allow for a significant reduction in office visits and tests, resulting in less costs and a minimum effect in patient's lives.

Acknowledgements: No financial disclosure.

Keywords: Age-Related Macular Degeneration, Ranibizumab, Treat And Extend, Pro Re Nata.

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Quality of Life as Indicator for Treatment Response in Patients with Diabetic Macular Edema and Low-Vision

Fernando Garcia-Rodriguez Lomas¹, Lourdes De Juan-Marcos¹, Emiliano Hernandez-Galilea¹, Maria Isabel Lopez-Galvez²

¹Hospital Universitario de Salamanca, Salamanca, Salamanca, Spain; ²Instituto Universitario de Oftalmobiología Aplicada, Valladolid, Valladolid, Spain

Introduction: The purpose is to evaluate the changes in vision-related quality of life in patients with diabetic macular edema (DME) and moderate/severe visual loss treated with ranibizumab monotherapy or combined with laser.

Methods or Study Design: Prospective study of 85 subjects with DME and low-vision (visual acuity $< 20/40$ in the best eye) treated with ranibizumab monotherapy or ranibizumab+laser according to the guidelines used in clinical practice. Monocular visual acuity (MVA), binocular visual acuity (BVA), central retinal thickness (CRT) and the impact on quality of life using the Visual Function Index (VF-14) were measured at baseline and month 6. We compared the scores of this questionnaire with the results of the National Eye Institute Visual Function Questionnaire (VFQ-25).

Results: The mean average change in MVA and BVA scores, CRT and VF-14 scores from baseline were higher in ranibizumab group compared to ranibizumab+laser group, but the differences were not statistically significant. The treatment either worst eye or best eye had an important benefit for patients in VF-14 scores. The correlation between changes in MVA and BVA with changes in VF-14 scores was moderate. The responses for VF-14 questions that reflected degree of difficulty with activities related to near vision and distance vision had strong statistically correlations with the VFQ-25 near vision and distance vision subscales.

Conclusions: Clinical measures of vision may fail to assess many aspects of visual disability that are important for patients with DME and moderate/severe visual loss. A little gain in VA in these patients is sufficient to permit them to conduct their activities dependent on vision they had lost, suggests that the value of small improvements in VA should not be underestimated in the management of DME. VF-14 may be considered as an effective tool to measure disability related to DME and it could be a useful indicator of treatment response in low-vision patients in clinical practice.

Acknowledgements: The authors thank the staff at the Department of Ophthalmology of the University Hospital of Salamanca for their assistance.

Keywords: Quality of Life, Indicator, Diabetic Macular Edema, Low Vision.

109**Macular Thickness in Insulin-Dependent Patients: Evaluation with OCT***Rossella Giannotti, Romualdo Malagola, Guia Bianchi, Loredana Arrico*

University Sapienza Department of Ophthalmology, Rome, Italy

Introduction: Diabetic patients not showing clinical alterations during routine eye examinations have been studied with OCT to evaluate whether it would be able to show subclinical retinal modifications.

Furthermore, we analyzed whether there is a seat of topographical macular predilection for the alterations and the connection between their onset and the duration of the disease.

Methods or Study Design: 78 Caucasian subjects, aged between 13 and 33, were enrolled. 40 of them were healthy subjects, and 38 were patients affected by insulin-dependent type I diabetes mellitus. OCT scans were performed and macular thickness maps were obtained on all subjects. Macular thickness was compared between diabetic and healthy subjects. Diabetic patients were divided in two subgroups, on the basis of disease duration ($\leq$ / $>$ 16 years), and compared with two age-matched subgroups of healthy subjects. Statistical analysis was performed using SPSS 19.0 for Windows. Mean RT values of different areas were compared using the Student t test. A $p < 0.05$ was considered statistically significant assuming equal variances.

Results: In patients affected by diabetes mellitus for 16 years or less no statistically significant differences could be detected in macular thickness. On the other hand, a statistically significant increase was detected in temporal macular thickness in patients affected by diabetes for more than 16 years. According to medical literature, macular thickness is significantly greater in men than in women.

Conclusions: OCT discloses early subclinical alterations in peripheral temporal macular region in patients affected by insulin-dependent diabetes for more than 16 years. Statistically significant macular thickening could be predictive of disease progression.

Acknowledgements: The Authors have no financial interest in any of the products mentioned in the manuscript.

Keywords: OCT, Macular Thickness, Diabetic Retinopathy, Pediatric Diseases.

128**Sensitivity and Specificity of Nassar Colour Test in Early Detection of Diabetic Macular Oedema***Moustafa Kamal Nassar¹, Mohamed Yasser Sayed Saif², Ahmed Tamer Sayed Saif³, Passant Sayed Saif⁴*¹Menofia University, Menofia, Egypt; ²Beni Suef University, Beni Suef, Egypt; ³Fayoum University, Fayoum, Egypt; ⁴Misr University for Science and Technology, Cairo, Egypt

Introduction: This study aims to evaluate the Sensitivity and Specificity of Nassar colour discrimination test with the presence of macular oedema in patients with diabetes Mellitus as a sensitive diagnostic tool for the detection of early functional changes.

Methods or Study Design: A Prospective, comparative case control study.

The study included 120 eyes with type I diabetes recruited from the outpatient clinic. All patients examined ophthalmologically and tested with Nassar Colour plate test, FFA and OCT. The Main Outcome Measures is The presence of mild or moderate tritans indicate early DME changes were documented in each group. Student's t-test and ANOVA (f) test were used for statistical analysis. p values less than 0.05 were considered statistically significant.

Results: The 120 patients seen were with type I diabetes. The mean age of the patients was 41.15 ± 5.61 years (range 23–49 years) with a mean disease duration of 13.56 ± 2.59 years (range 10–20 years). All patient with dry macula ($n = 60, 50\%$) were normal while with DME showed normal ($n = 6, 5\%$), mild tritan ($n = 14, 11.66\%$) and moderate ($n = 40, 33.33\%$) the nassar color test is 90% Sensitivity and 100% Specific.

Conclusions: The Nassar color plate is a cheap and effective test to early detect macular edema and recommend to be used in all ophthalmic primary examination especially in areas far away from OCT and FFA.

Acknowledgements: To Prof Dr Sayed Saif.

Keywords: Nassar Color Test, Diabetic Macular Edema, Color Deficiency.

130**Sociodemographic Factors Responsible for Vision Impairment in Diabetic Patients in Beni-Suef Governorate***Mohamed Yasser Sayed Saif, Safaa Awad-Allah Mohamed, Shaimaa Ahmed Senosy, Atef Ezzelarap Sameda*

Beni Suef University, Beni Suef, Egypt

Introduction: To evaluate Sociodemographic factors responsible for vision impairment and blindness among diabetic patients in Beni-Suef Governorate.

Methods or Study Design: The study was conducted on 200 (two hundred) patients of Beni-Suef university hospital outpatient clinic patients selected were diabetics an legally blind (visual acuity $\leq 6/60$), all patients were asked to answer a specially designed questionnaire.

Results: Knowledge about consequences of diabetes on the eye was low (31%), patients received laser treatment were more aware about consequences of diabetes ($p \leq 0.02$), as level of education increases patient knowledge about ocular complications of diabetes increases ($p \leq 0.001$), patient knowledge about complications of diabetes from internists and media was low while from ophthalmologists was greater ($p \leq 0.02$).

Conclusions: A greater role of media and internists is recommended in informing diabetics about complications of diabetes and importance of regular follow-up, long term reduction of ocular complications of diabetes may be fulfilled by increasing level of education.

Acknowledgements: None.

Keywords: Sociodemographic Factors, Vision Impairment, Diabetic Patients.

Imaging

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Autofluorescence Changes in Patients with Exudative Age-Related Macular Degeneration Undergoing Anti-VEGF Therapy

M^a Angeles González Garrido, Juan Jose Navarro Esteban, Ricardo Menoyo Calatayud

Hospital Virgen De La Luz, Cuenca, Cuenca, Spain

Introduction: The aim of the investigation was to evaluate the possible occurrence and development of retinal pigment epithelium damage or atrophy in patients with age related macular degeneration undergoing anti-VEGF therapy.

Methods or Study Design: A prospective study with patients presenting active choroidal neovascularization treated with anti-VEGF Ranibizumab.

They were followed during 3 months by fundus photograph retinography and autofluorescence images (Spaide set filters /Topcon TRC-50dx IMAGENet system; wavelength range excitation filter: 535–585 nm, wavelength range barrier filter: 605–715 nm) at baseline and follow up.

Demographics, visual acuity and the type of choroidal neovascular membranes were recorded.

Autofluorescence images were evaluated for the presence of absence or areas of increased or reduced signal. Areas were measured by outlining them using the image analysis software (pixels were automatically converted into millimeters).

Results: Thirty-three eyes of 30 patients were followed. CNV activity was present in 11 patients (33.3%) at the end of the third dose, in front of 22 patients (66.7%) with no signs of activity in OCT images.

The enlargement of altered FAF areas was statistically significant in both groups, despite the success of the intravitreal treat-

ment (GROUP with no CNV final activity: Mean baseline = 10.74 mm²; SD = 7.01 mm²/Mean 3rd month = 14.62 mm²; SD = 7.77 mm²; $p < 0.001$. GROUP with CNV final activity Mean baseline = 12.79 mm²; SD = 7.46 mm²/Mean 3rd month = 17.10 mm²; SD = 8.90 mm²; $p = 0.001$).

Conclusions: RPE alterations were frequently observed in patients with age-related macular degeneration and choroidal neovascular membranes undergoing antiVEGF therapy.

In our study we have detected a progression of mean size of altered FAF areas in all the patients.

We have to consider that the chronic application of anti-VEGF should be used judiciously to avoid undesired off-target effects that could affect subsequently to visual acuity of our patients.

Acknowledgements: To Fundacion Sociosanitaria of Castilla La Mancha and to our patients.

Keywords: Autofluorescence, AntiVEGF, Exudative Age Related Macular Degeneration.

Other Retinal Disorders

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Ocular Manifestations in Korean Patients with Transbronchial Lung Biopsy-Proven Sarcoidosis

Shin Jeong Ah

St. Paul's Hospital, Seoul, Korea

Introduction: To evaluate the characteristic ocular signs and systemic examination findings in patients with transbronchial lung biopsy (TBLB)-proven sarcoidosis.

Methods or Study Design: A total of 28 patients with TBLB-proven sarcoidosis were evaluated between January 2011 and December 2012. The medical records of patients were retrospectively reviewed. We evaluated the following five characteristic ocular signs that are suggestive for the diagnosis of sarcoidosis: (1) mutton-fat keratic precipitates and iris nodules; (2) nodules at the trabecular meshwork and tent-shaped peripheral anterior synechia; (3) snowball or string-of-pearls vitreous opacities; (4) nodular peripheral phlebitis; (5) multiple chorioretinal lesions. The results of systemic examination, including serum angiotensin converting enzyme (ACE) assay, chest radiography or computed tomography of the chest, pulmonary function tests (PFT), tuberculin skin test and bronchoalveolar lavage (BAL), were considered for each patient.

Results: Eighteen patients (64.2%) showed ocular signs, which are suggestive of ocular sarcoidosis. Thirteen (72.2%) of these 18 patients presented with ocular signs as the initial manifestation of the disease. The typical findings of chest CT, such as bilateral hilar lymphadenopathy (BHL), were observed in all of the 28 patients.

Conclusions: It can be suggested that intraocular lesions could be the sole clinical manifestation of the disease. Therefore, it is important to perform pulmonary examination including chest CT in patients with suspicious ocular sarcoidosis.

Acknowledgements: The author would like to thank Pf. Park for his the valuable comments on the grafts of this report.

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Relationship between Color Vision Deficiency and Foveal Anatomical Changes in Retinitis Pigmentosa

*Pamela Campos Figueroa*¹, *Bárbara Delás Alós*¹,
*Gemma Julio Morán*², *Suhel Elnayef Elsakan*¹, *Mouafk Asaad*¹

¹Consorti Sanitari de Terrassa, Barcelona, Barcelona, Spain;

²Universitat Politècnica de Catalunya, Barcelona, Barcelona, Spain

Introduction: The progression of retinitis pigmentosa (RP) leads to loss of visual acuity and color vision deficiency. The purpose of this study is to determine whether results of color vision tests, Ishihara and Farnsworth-Munsell (FM) D-15, could be good markers of RP central impairment.

Methods or Study Design: The relationship among the foveal anatomical features, confirmed by Optical Coherence Tomography (OCT), and the visual parameters (visual acuity and different color vision indexes) in eyes with RP were analyzed. The number of errors by both tests was quantified, and different indexes from the test FM D-15 were also calculated. The external limiting membrane (ELM), the IS/OS layer and the cone outer segment tips (COST) were assessed as well as the presence/absence of the dome shape of the IS/OS layer, called foveal bulge (FB).

Results: Twenty-five eyes of 25 patients affected by RP were included. Most of the eyes presented color vision impairment of variable severity. At the central retina, ELM, IS/OS and COST layers were shortened showing different levels of deterioration, being the ELM the most preserved layer, followed by IS/OS and, last, COST. The great majority had a total or partial loss of foveal bulge (FB). The anatomical variables, mainly IS/OS and FB, showed statistically significant correlations with visual acuity (Snellen), two indexes from FM D-15 and with the number of errors in both color tests.

Conclusions: Ishihara test results were the best related to anatomical impairment, which could indicate that color deficiencies were not recent since most of the eyes had lost COST and FB. It is plausible to think that color vision tests, especially FM D-15, may acquire more relevant role in other samples with earlier foveal alterations. Therefore, color vision tests could be considered as good indicators of the progression of RP but their efficacy may change depending on the foveal impairment level.

Acknowledgements: No financial disclosure.

Keywords: Retinitis Pigmentosa, Color Vision Deficiency, Foveal Changes, Optical Coherence Tomography.

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Efficacy of Intravitreal Ozurdex® in Treating Postoperative Pseudophakic Cystoid Macular Edema (Irvine-Gass Syndrome)

Emilia Tarrago Simon, *Francisco Ortiz Ramirez*

General Hospital Onteniente, Onteniente, Valencia, Spain

Introduction: Post cataract cystoid macular edema (CME) is also known as Irvine-Gass syndrome, and its known to be the most common cause of unexpected visual loss after cataract surgery. The chronic refractory CME remains as a therapeutic challenge and there is not widely accepted technique to treat chronic Irvine-Gass syndrome.

The purpose of the study is to evaluate the efficacy of intravitreal Ozurdex® in patients with chronic cystoid macular edema (CME) after cataract surgery.

Methods or Study Design: Prospective study of patients with refractory CME after cataract surgery who received intravitreal treatment with Ozurdex®. The main outcome measures were visual acuity (VA) and central retinal thickness on optical coherence tomography (OCT). The statistical analysis was made with the Wilcoxon test using the SPSS program.

Results: 16 eyes of 16 patients were included. All the patients have a topical treatment with bromfenac and brinzolamide. The mean VA at baseline was 0.26 and 0.78 at the end of the study ($p < 0.05$). Besides there was a statistically reduction of the mean central retinal thickness on OCT from 528 μ at baseline to 284 μ at the end of the study ($p < 0.05$). The mean follow up was 24 week. None of the patients required additional doses of Ozurdex®. It was an increase of the ocular pressure in two patients which were controlled with topical treatment.

Conclusions: Ozurdex® seems to be safe and effective treatment for the refractory CME after cataract surgery. Nevertheless new prospective, randomized, controlled studies are needed for assessing the efficacy and safety of the Ozurdex® in the treatment of the CME secondary to Irvine-Gass syndrome.

Acknowledgements: None.

Keywords: Irvine-Gass Syndrome, Cystoid Macular Edema, Ozurdex®, Intravitreal Injection.

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Resolution of Foveal Detachment in Dome-Shaped Macula after Treatment by a Intravitreal Bevacizumab Injection in a Refractory Case Treated with Repeated Intravitreal Ranibizumab Injections

Ana Montoliu Antón, María Soledad Peña, Elena Sorlí Clemente, María Del Lledó Redón Soriano, Luis León Ibañez, Assumpció Gorro Miró, Francisco Ramos Martí

Hospital General Universitario de Castellón, Castellón, Castellón, Spain

Introduction: Dome shaped macula (DSM) was first described in 2008 using optical coherence tomography (OCT) by Gaucher et al. It was described as a convex protusion of the macula within a posterior pole staphyloma, associated more frequently with a high level of myopia or elevated eye axial length. DSM can be complicated by serous foveal detachment (SFD), its prevalence is highly variable according to existing studies and fluctuates between 6% and 52%. There are only a few published reports of successful treatment of SFD associated with DSM, none using intravitreal anti-vascular endothelial growth factor (anti-VEGF) injections. This report describes the complete resolution of SFD in DSM by a intravitreal bevacizumab injection.

Methods or Study Design: A 21-years-old caucasian male was diagnosed with DSM in 2010. Her past medical history was remarkable for Klinefelter syndrome and hyperinsulinism and high miopia with 17D in both eyes. Several ranibizumab injections had been used in attempt to decrease the SFD in right eye unsuccessfully.

Results: In August 2014, one bevacizumab injection in right eye was used and visual acuity improved from 0.4 to 0.8 and it remained stable for 9 months. The SFD has disappeared with no recurrence.

Conclusions: In literature, some reports described verteporfin photodynamic therapy and spironolactone as useful aims to resolve the SFD in DSM. In our case, bevacizumab appeared to be effective in decreasing the SFD associated with DSM, and we think it should be considered for refractory cases.

Acknowledgements: María Soledad Peña, Elena Sorlí Clemente, María del Lledó Redón Soriano, Luis León Ibañez, Assumpció Gorro Miró, Francisco Ramos Martí.

Keywords: Dome-Shaped Macula, Serous Foveal Detachment, Treatment, Resolution, Bevacizumab.

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Diagnostic Value of the Visual Evoked Potential Investigation in Optic Neuritis

Gavhar Husanovna Khamraeva, Halidjan Mahamadjanovic Kamilov, Munirahon Sadikjanovna Kasimova

Tashkent Institute of Postgraduate Education, Tashkent, Uzbekistan

Introduction: VEPs registration is a valuable diagnostic test in the evaluation of patients with optic neuritis (ON). Verification of the visual pathway lesion is particularly important in the absence of changes in the fundus in patients with retrobulbar neuritis and early stages of inflammation of the optic nerve. Despite the large number of articles devoted to this issue, the dynamics of changes in VEPs in ON are still under discussion.

Methods or Study Design: The study included 90 patients (90 eyes) with different stages of ON. Group 1 included 28 patients (28 eyes) with hyperemia of the OD, Group 2 included 21 patients (21 eyes) with edema of the OD, Group 3 included 26 patients (26 eyes) with ischemia of the OD, and Group 4 included 15 patients (15 eyes) with glial atrophy of the OD.

A control group comprised 10 somatically healthy persons (10 eyes) of the same age without ophthalmic pathology. All examined underwent standard ophthalmologic examination, including visometry, tonometry, perimetry, and ophthalmoscopy, as well as optical coherence tomography (OCT) and visual evoked potentials (VEP) determination.

Results: Almost all the subjects showed an increase in P100 latency from 10 to 30 ms compared to the upper limit of normal values upon checkerboard pattern stimulus. In Group 1, this parameter was 109.86 ± 2.11 ms, which was significantly higher vs. the control group ($p < 0.05$). In the stages of edema and ischemia, this parameter tended to increase, and amounted to an average of 112.73 ± 3.52 ms ($p < 0.05$) and 123.65 ± 3.93 ms ($p < 0.05$), respectively. We also registered an increase in latency in Group 4 by 20% to 25%.

Conclusions: The VEP parameters provide identification of the functional disorders of the optic nerve. Our results showed that there is delayed latency and reduced amplitude of the P100 component in patients with ischemic and atrophic stages of the disease.

Acknowledgements: We have no acknowledgements.

Keywords: Optic Neuritis; Visual Evoked Potentials (VEPs); Optical Coherence Tomography (OCT).

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Changes in Inner Retina Adjacent to Full-Thickness Macular Hole

Alvaro Fernández-Vega González¹, Barbara Delas², Gemma Julio³, Jeroni Nadal¹

¹Centro de Oftalmología Barraquer, Barcelona, Barcelona, Spain; ²Hospital de Terrassa, Barcelona, Barcelona, Spain; ³UPC, Barcelona, Barcelona, Spain

Introduction: Full-thickness macular hole (FTMH) is probably caused by tissue tangential separation but mechanism remains controversial. This study aims to compare the inner retinal complex thickness (IRCT) adjacent to FTMH with the contralateral healthy eye. Changes may help to clarify FTMH formation.

Methods or Study Design: Seventeen eyes of 17 patients, 9 males and 12 females; mean age 66 ± 6 (51–74), with stage 2 FTMH were enrolled. Contralateral eyes were the controls. Measurements of IRCT (from nerve fibre layer to inner nuclear layer) were made at 1000 (IRCT1) and 2000 μm (IRCT2) from the centre of the fovea using optical coherence tomography images in nasal and temporal side. Wilcoxon rang test was applied in comparison assessments.

Results: The mean nasal IRCT1 and IRCT2 in FTMH were 235 ± 43 and 194 ± 39 μm , respectively. At temporal side mean IRCT1 = 211 ± 44 and IRCT2 = 160 ± 22 μm . Control eye mean nasal IRCT1 and IRCT2 were 202 ± 21 and 184 ± 19 μm , respectively. Temporal data of IRCT1 = 171 ± 27 and IRCT2 = 157 ± 17 μm .

Significantly higher IRCT values were found in FTMH than in control eyes at the same locations ($p = 0.004$ for nasal IRCT1; $p = 0.004$ for temporal IRCT1 and $p = 0.036$ for temporal IRCT2), except for nasal IRCT2 that displayed similar results. IRCT1 were always higher than IRCT2 in both FTMH and control eyes ($p = 0.001$ in FTMH and temporal control comparisons and $p = 0.006$ in nasal control comparison). Nasal were significantly higher than temporal values ($p = 0.001$ or lower in all the analyses) and differences tended to be similar between FTMH and control eyes ($p > 0.05$).

Conclusions: FTMH eyes seem to show a higher IRCT beyond the lesion. This abnormality could be longer in temporal side and vitreomacular traction could be a plausible cause.

Acknowledgements: All the people who made this work possible.

Keywords: Full-Thickness Macular Hole, Inner Retinal Complex, Vitreomacular Traction, Pathogenesis.

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Total Length of the Outer Retinal Tubulations and His Clinical Impact

Jaime Campos-Pavón, Lara Esquinas-Beas, Javier Sambricio-García, Almudena De Pablo-Cabrera

H.U.12 de Octubre, Madrid, Madrid, Spain

Introduction: Outer retinal tubulations (ORT) develop from the invagination of the photoreceptor layer following damage in the retinal pigment epithelium (RPE) and/or outer retina in some degenerative retinal disorders. They present as round hyporreflective structures with hyperreflective borders. Two subtypes have been described: pseudodendritic and perilesional.

Our objective is to study the possible correlation between the total length, distance to the fovea or subtype of ORT and the visual acuity in patients with Age-related Macular Degeneration (AMD).

Methods or Study Design: A descriptive study was performed, applying the 'En Face' Optical Coherence Tomography scan technique, also called C-Scan OCT, to a sample of 18 eyes from 16 patients with AMD that presented ORT. A tridimensional reconstruction was obtained, generated by macular mapping consisting of 145 30 μm transverse sections in a $15^\circ \times 30^\circ$ mm^2 central retinal area. The total length of the ORT was measured with the Spectralis Heidelberg kaleidoscope. This data was then analyzed along with the visual acuity of patients, using Student's t-test to compare with subtype of ORT, and Pearson's r to compare with total length and distance to the fovea.

Results: The mean total length of the ORT was 2569 μm and the mean distance to the fovea was 935.61 μm . Seven eyes presented with pseudodendritic subtype and eleven with perilesional subtype.

No lineal correlation was found between the length or the distance to the fovea and the visual acuity ($r_2 = 0.138$ and $r_2 = 0.071$).

No statistically significant difference was found in the correlation between ORT subtype and visual acuity, using Student's t-test.

Conclusions: In our study, no correlation was found between total length, subtype or distance to the fovea and the patients' visual acuity. There are no other published studies that describe or compare this data.

Acknowledgements: Acknowledgments to Rodolfo Aburto, resident at the Service of Ophthalmology, who manipulated statistical data and to Maribel Redondo.

Keywords: Outer Retinal Tubulations, Total Length, Visual Acuity, Subtype.

Other Retinal Disorders

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Intravitreal Aflibercept for the Treatment of Chronic Central Serous Chorioretinopathy: Case Report

M^a Angeles Gonzalez Garrido, Ricardo Menoyo Calatayud, Juan Jose Navarro Esteban, Miguel Angel Gallego Domingo

Hospital Virgen De La Luz, Cuenca, Cuenca, Spain

Introduction: The aim was to evaluate the efficacy of intravitreal Aflibercept injection as a treatment for eyes with chronic central serous chorioretinopathy (CSCR).

Methods or Study Design: We present three patients with chronic CSCR who received a variable treatment regimen of intravitreal Aflibercept. Subfoveal fluid was present on OCT for at least six months before Aflibercept treatment. Patients were followed with monthly best-corrected visual acuity (BCVA) and optical coherence tomography (OCT).

Results: No patients experienced serious ocular or systemic adverse effects during the follow up (3 to 9 months). All the patients improved BCVA after the first dose of Aflibercept, and mean central macular thickness decrease and even had complete resolution of subfoveal fluid. One patient presented a recurrence at the third month of the first dose, needing a second injection of Aflibercept with good results.

Conclusions: Intravitreal Aflibercept was well tolerated as a treatment for chronic CSCR. Larger controlled trials are needed to confirm if Aflibercept could represent in the future a good alternative for chronic CSCR instead.

Acknowledgements: To our work team and to our patients.

Keywords: Aflibercept, Chronic Central Serous Chorioretinopathy, AntiVEGF.

Other Retinal Disorders

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Tocilizumab as an Alternative Treatment in Refractory Birdshot Disease

Ana Montoliu Antón, María Soledad Peña, Patricia Tejón Menéndez, Luis León Ibañez, Assumpció Gorro Miró, Irene Gregori Gisbert, Francisco Ramos Martí

Hospital General Universitario de Castellón, Castellón, Castellón, Spain

Introduction: Due to the chronic course of the Birdshot disease, steroids sparing agents are needed to control inflammation. Recently, biologic therapy, like Adalimumab or Infliximab, have been used with relative success. We propose Tocilizumab as an option in refractory Birdshot disease.

Methods or Study Design: A 46-years-old female was diagnosed with Birdshot disease HLA-B29 (+) in 2010. Several immu-

nosuppressive drugs had been used in an attempt to control inflammation: cyclosporine was ineffective, infliximab triggered a hypersensitive reaction, Adalimumab plus methotrexate had partial response without full control of the inflammation, and adjuvant intravitreal ranibizumab, pegaptanib and dexametasone had a poor response in the treatment of the macular edema.

Results: In August 2014 Tocilizumab therapy (8 mg/kg monthly) was initiated and two months later visual acuity improved from 20/70 OD and 20/30 OS to 20/50 OD and 20/20 OS with almost complete resolution of the macular edema.

Conclusions: Although we have many options for the treatment of Birdshot retinochoroidopathy, there is no consensus on how to deal with the inflammation and a therapeutic strategy has yet to be formulated. In our case, Tocilizumab appeared to be effective in controlling inflammation and macular edema resistant to other treatments, and we think it should be considered for refractory cases.

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Keywords: Birdshot, Tocilizumab, Treatment, Macular Edema, Response.

Vitreoretinal Surgery

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New Method for Increase Retinal Cells Layers Metabolism and Retinal Cells Regeneration and Visual Field, Avoid Complications after Vitreoretinal Surgery

Mehran Mehran Masoudnaseri

FILATOV, Odessa, Ukraine

Introduction: To increase speed of Retinal cells regeneration and improve visual field and avoid complications after vitreoretinal surgery by Masoud Nano silicon balloon.

Methods or Study Design: To Prevention of contact between silicon oil and retinal cell layers and decrease of presser on retinal cells increase speed of Retinal cells regeneration and Metabolism, avoid of penetrate oil to AC after vitrectomy surgeon must be injection oil by the syringe of silicon oil into the Masoud balloon in vitreous cavity, Then filled the bubble with oil or (N-saline) up to normal pressure and fixed on sclera. Silicon oil with balloon should be simultaneously removed in (1-3) month after surgery.

Results: Injection of silicon oil in vitreous cavity into the balloon Causes that oil dose not penetrated to retinal cells layers, Does not get to anterior chamber and contact with corneal endothelial layer, to vessels, oil does not get through the retinal breaks, and macula hole, normalize IOP, improve visual fields, and avoids postoperative complication.

Conclusions: This method improve metabolism of retinal cells layers, and increase visual field, and avoid complications after surgery.

Acknowledgements: None.

Keywords: Metabolism, Vitreoretinal, Regeneration.

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Erratum

In the work '15th ESASO Retina Academy. October 22–24, 2015, Barcelona, Spain: Abstracts' [Ophthalmic Res 2015;54(suppl 1):1–74, DOI: 10.1159/000440896], the following author needs to be added to Abstract 184 by El-Kashab and Kotamarthi entitled 'Ocriciplasmin outcome in real life experience' (p. 45):

Georgios Tsokolas