941 - D771
The Association of Candidemia and Ocular Candidiasis: Meta-Analysis of the Literature
L. I. Kump, E. Margalit. Ophthalmology, University of Nebraska Medical Center, Omaha, NE.

Purpose: To evaluate prevalence of fungal endophthalmitis and chorioretinitis in patients with candidemia using meta-analytical techniques.

Methods: Medline review covering January 1993 through March 2007 with the search terms “Candida or candidemia or candidiasis” and “endophthalmitis or chorioretinitis” was conducted. Analysis of all peer-reviewed articles of candidemia-associated fungal endophthalmitis and chorioretinitis published in the English language was performed.

Inverse variance method was applied to the study.

Results: Twenty two articles met the inclusion criteria. Ten studies were prospective and 12 retrospective. Seven studies were on adults and 15 on pediatric patients. Total number of patients was 1014; there were 64 patients with ocular candidiasis.

Mean and confidence interval weighted by meta-analytic 1/2 weight was calculated. A weighted mean prevalence of 1.78% was found with a 95% confidence interval of approximately 0.99% to 2.62%.

Conclusions: The linkage of candidal sepsis with candidal endophthalmitis / chorioretinitis suggested the use of ocular examinations to diagnose invasive candidiasis. Our analysis reveals that ocular involvement in candidemic patients is rare. It is attributed to prompt systemic antifungal therapy. In the reviewed literature, the results of eye evaluations did not alter the course of antifungal therapy.

Randomized prospective multi-center trial on patients with ocular candidiasis and candidemia could potentially elucidate the incidence of ocular involvement in fungal sepsis. Development and acceptance of universal guidelines are necessary for ocular evaluation of candidemic patients.

CR: L. I. Kump, None; E. Margalit, None.
Support: None

942 - D772
Characterization of Retinal Inflammation in a Murine Model of Endotoxin-Induced Uveitis

Purpose: To characterize and investigate the mechanism of retinal inflammation that occurs in a murine model of EIU by measuring cytokine and chemokine production, adhesion molecules expression and inflammatory cell migration as a response to different parameters such as mouse strain, age, animal vendor, dose and time of LPS

Methods: EIU was induced by intraperitoneal injection of LPS in 0.1ml PBS. Mice were euthanized at indicated time points. Eyes and retinas were collected and protein extracts were prepared for western blot, cytokine and chemokine analysis using a multiplex assay (Pierce). To determine retinal leukocyte infiltration, the opposite eye was fixed in 4% paraformaldehyde and retinas were dissected for whole mount immuno-staining of neutrophils (Gr-1) and macrophages (F4/80).

Results: Following LPS exposure, various inflammatory markers (IL-6, MCP-1, KC, IL-1b, VEGF) were up-regulated in the retina in a time and dose dependent manner. A time-dependent infiltration of inflammatory cells was also observed with the peak level at 24 hours. This retinal inflammation appeared more prominent in younger mice (6-7-weeks old) than older mice (11 weeks old). Further characterization revealed that the sensitivity of LPS stimulation in the retina was affected by mouse strains (C57BL/6 > Balb/c) and vendor source (C57BL/6 Taconic > Charles River Lab > Jackson). Moreover, mice carrying either TLR4 deletion or a defective LPS response allele Tlr4<sup>−/−</sup> were resistant to LPS-induced retinal inflammation. Lastly, blocking one of the signal transduction pathways downstream of TLR4, the TNFα pathway, by anti-TNFα antibody (Enbrel) p. partially inhibited the production of inflammatory mediators and retinal leukocyte accumulation.

Conclusions: Endotoxin induced uveitis is an useful model for studying inflammatory processes within the eye. Based on our study we found that age, mouse strain and vendor source had significant impacts on the ocular inflammatory response to LPS. TLR4 signaling is essential for LPS-induced retinal inflammation and can be ameliorated with anti-TNF therapy.

CR: O. Delgado, Novartis, E. M. Crowley, Novartis, E. S. Louie, Novartis, B. Jaffee, Novartis, E. S. Liao, Novartis, E.
Support: Novartis

943 - D773
SOCS3 Is Required to Protect Photoreceptor Cell Function During Retinal Inflammation
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Purpose: To investigate the role of suppressor of cytokine signaling 3 (SOCS3), an intracellular, ligand-induced negative feedback modulator of STAT3 activation, in the photoreceptor cell protection during retinal inflammation. We have previously reported that SOCS3 is required for the onset of photoreceptor cell differentiation and Rhodopsin expression in the perinatal retina. Here, we demonstrate an important role of SOCS3 in the adult retina during inflammation.

Methods: SOCS3-deficient and wild-type adult mice were intraperitoneally injected with Lipopolysaccharide (LPS) to induce retinal inflammation. Expression of SOCS3 and activated STAT3 in the adult retinas were analyzed immunohistochemistry. STAT3 activation and Rhodopsin expression were measured by immunoblot analysis 8 and 48 hours, and 10 days after LPS injection. Electretocinogram (ERG) was recorded 10 days after LPS injection.

Results: SOCS3 was expressed in the photoreceptor cells in the adult retinas. During inflammation, STAT3 activation was more intensive in the SOCS3-deficient mice, especially in the photoreceptor cells. Concomitantly, Rhodopsin expression during retinal inflammation was decreased also in the wild-type mice but more rapidly and profoundly in the SOCS3-deficient mice. Decrease of a-wave amplitude in ERG was prolonged and still observed 10 days after LPS injection only in the SOCS3-deficient mice.

Conclusions: SOCS3 is required to inhibit excessive STAT3 activation and minimize the decrease in Rhodopsin. SOCS3 contributes to protect visual function during retinal inflammation. In particular, SOCS3 is required to inhibit STAT3 activation in the photoreceptor cells.

CR: Y. Ozawa, None; K. Nakao, None; T. Kurihara, None; T. Shimazaki, None; S. Shimamura, None; S. Ishida, None; A. Yoshimura, None; K. Tsujita, None; H. Okano, None.
Support: None

944 - D774
Multiple Evanescent White Dot Syndrome in a Patient With Multifocal Choroiditis and Unilateral Hearing Loss
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Purpose: The White Dot Syndromes are a group of rare inflammatory disorders of the retina, pigment epithelium and choroid that include Multiple Evanescent White Dot Syndrome, Multifocal Choroiditis, Acute Posterior Multifocal Placoid Pigment Epitheliopathy, Serpiginous Choroidopathy, Birdshot Retinochoroidopathy and Punctate Inner Choroidopathy. Here we report a unique case of a patient presenting with Multiple Evanescent White Dot Syndrome, Multifocal Choroiditis and Unilateral Hearing Loss.

Methods: A thorough review of the White Dot Syndromes and their relationship to Multifocal Choroiditis, Serpiginous Choroidopathy, Birdshot Retinochoroidopathy and Punctate Inner Choroidopathy have been reported with Choroiditis and Unilateral Hearing Loss. To our knowledge this is the first report of an immune-mediated hearing loss associated with the White Dot Syndromes. Specifically, both Acute Posterior Multifocal Placoid Pigment Epitheliopathy and Birdshot Retinochoroidopathy have been reported with serpiginous hearing loss. To our knowledge this is the first report of an immune-competent patient with unilateral hearing loss, evidence of Multifocal Choroiditis and a subsequent diagnosis of Multiple Evanescent White Dot Syndrome. The finding of these three rare conditions in a single otherwise healthy patient could be explained by a common underlying susceptibility to a post-infectious inflammatory state or autoimmune process. Due to the rarity of such cases, no definitive conclusions may be drawn, but require ongoing consideration and further study.

CR: S. M. Ronan, None; A. Aizman, None; R. E. Hackel, None; S. J. Saxe, None.
Support: None

941-944
947 - D777
Relevance Vector Machine Analysis of Multifocal ERGs of Eyes in HIV-Positive Subjects Without Infectious Retinitis Shows Deficiencies Compared to Normal Eyes

Purpose: Studies have demonstrated structural and functional inner retinal damage in HIV-positive subjects without infectious retinitis, suggesting subtle retinopathy. We applied multifocal electroretinography (mERG) of the posterior pole in these patients and HIV negative controls. We used machine learning classifiers (MLCs) to determine if electrophysiologic recordings in HIV subjects differ from those in non-HIV individuals.

Methods: Standard mERG was used in 51 patients with high CD4 counts (86 eyes), 54 patients with a history of low CD4 counts (85 eyes) and 41 age-matched non-HIV subjects (82 eyes). None of the eyes had visible retinopathy. A thread electrode (DTL Plus Electrode, Diagnosis LLC, Lowell, MA) was used for recording. The stimuli were displayed on a CRT monitor with RETIscan software Version 3.20.15 (Roland Consult Elektrodiagnostische Diagnostik Systeme, Wiesbaden, Germany). The mean simultaneous exposure time for the second order kernel was recorded. Implicit times (a and b latencies) and response densities (a and b amplitudes) were measured. Eight cycles were averaged for each subject from 103 hexagonal locations and analyzed with the RETIscan software. We trained relevance vector machines (RVM), which are probabilistic MLcs, with supervised learning on latencies or amplitudes. Ten-fold cross validation separated the training cases from the test cases. The area under the ROC curve (AUC) was analyzed to determine if mERG patterns of either low CD4 or high CD4 HIV subjects differed significantly from normals.

Results: The age distribution of the three classes of subjects was 38.4±5.6 for normal, 41.4±8.1 for low CD4, and 44.6±8.5 for high CD4. For example the AUC for low CD4 was 0.80±0.05, for high CD4 was 0.83±0.04 (p<0.04 compared to chance) and 0.70±0.04 (p<0.01), respectively. For low CD4, the b amplitude and latency were 0.531±0.047 (p=0.02) and 0.70±0.042 (p<0.001). Feature selection ranked mERG locations for utility in differentiating classes.

Conclusions: mERG objectively shows cumulative functional damage in HIV retinopathy in both high and low CD4 subjects compared to non-HIV normal retinas. MLcs can ease interpretation of mERGs. It can be difficult for human observers to learn to interpret mERGs. In contrast, RVM learns from the data how to detect differences in non-infectious HIV retinopathy that are not apparent to human experts assessing mERG recordings.

CR: M.H. Goldbaum, I. Falkenstein, None; D. Bartch, None; J. Hao, None; I. Kozak, None; F. Mojana, None; N. Nigam, None; T. Lee, None; T.J. Sejnowski, None; W.R. Freeman, None.

Support: NIH Grant EY13928, NIH Grant EY07366, David and Marilyn Dunn Foundation.

948 - D778
Upregulation of P-Selectin Glycoprotein Ligand-1 During Endotoxin Induced Uveitis

Purpose: We have shown a critical role for p-selectin glycoprotein ligand-1 (PSGL-1) blockade in endotoxin-induced uveitis (EIU). Lipopolysaccharides (LPS) is reported to down-regulate PSGL-1 on leukocytes, however, our recent data suggest the opposite. This motivated us to investigate PSGL-1 regulation and function during EIU.

Methods: Uveitis was induced in mice by i.p. injection of 10μg LPS. PSGL-1 function was investigated using our autopulsed micro flow chamber, coated with murine P-selectin (5μg/ml). Flow cytometry was performed on peripheral blood leukocytes (PBL) using PE-conjugated anti-PSGL-1 mAb (2H14, 1μg/106 cells) or IgG control. To release rolling leukocytes from the vascular wall, normal and EIU mice were treated with either anti-PSGL-1 neutralizing mAb (4RA10) or rat IgG. PE-conjugated goat-anti-rat IgG was used for secondary staining. PBL counts were performed using a Coulter Counter.

Results: Leukocyte rolling velocity was significantly reduced on immobilized P-selectin on post LPS (2.7±0.2 mm/s, n=4 vs. 4.1±0.2 mm/s in normal mice, n=6, p<0.05). However, 24h after LPS leukocytes rolled at similar velocities (4.0±0.6 mm/sec, n=4 vs. 4.0±0.8) as those from control mice. In parallel, PBL counts from EIU mice significantly decreased 6h after LPS injection (1074±218/μl, n=6, p<0.001) but were not significantly different from normal controls (792±37/μl, n=6) by 24h (216±53/μl, n=4, p=0.1). Flow cytometry revealed a significant decrease in mean fluorescence intensity (MFI) of PSGL-1 in PBLs after LPS injection (219±152/μl, n=4) compared to controls (453±91/μl, n=4), however, 24h after LPS, PSGL-1 MFI was not significantly different from normal animals (355±59, n=4, p=0.2). PBLs from mice injected with anti-PSGL-1 mAb (2H14, 1μg/106 cells) or IgG control. To release rolling leukocytes from the vascular wall, normal and EIU mice were treated with either anti-PSGL-1 neutralizing mAb (4RA10) or rat IgG. PE-conjugated goat-anti-rat IgG was used for secondary staining. PBL counts were performed using a Coulter Counter.

Conclusions: These results reveal a previously unrecognized upregulation of PSGL-1 during acute inflammation, which may explain the reduced leukocyte rolling velocity on immobilized P-selectin in the ocular vasculature. These data further support our notion that PSGL-1 may become a key target in treatment of ocular inflammatory diseases.

CR: L. Almulki, None; K. Noda, None; R. Amini, None; A. Schering, None; S. Nibaban, None; F. Tayyari, None; K. Thomas, None; S. Masli, None; A. Hafezi-Moghadam, None.

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**950 - D270**

**Localization of Vascular Adhesion Protein-1 in Human Ocular Tissues**


**Purpose:** Recently we showed a critical role for Vascular Adhesion Protein-1 (VAP-1) in a model of uveitis. VAP-1 inhibition ameliorated signs of acute inflammation, including retinal leukostasis and cytokine production in EU animals. However, until now the expression of VAP-1 in the human eye was not known.

**Methods:** Paraffin blocks of human ocular tissues were obtained from MEEF tissue sample archives. VAP-1 tissue localization was assessed in 5 µm thick sections using immunohistochemistry. Sections were incubated with primary mAbs against VAP-1 (5 µg/ml), smooth muscle actin (1 µg/ml), or isotype matched IgG at 4 °C overnight. Subsequently, a secondary antibody (mouse envision system) was used for 30 min at room temperature followed by Dako Envision + HRP (AEC) system for signal detection. The stained sections were examined using light microscopy and the signal intensity was quantified by two masked evaluators and graded into 4 different categories, non-detectable (0) to higher intensities (1, 2, and 3).

**Results:** Within various ocular tissues, VAP-1 staining was confined to the vasculature. VAP-1 labeling showed the highest intensity in both arteries and veins of neuronal tissues, retina and optic nerve, and the lowest intensity in the iris vasculature. Scleral and choroidal vessels showed moderate staining for VAP-1. VAP-1 intensity was significantly higher in the arteries compared to veins. Furthermore, VAP-1 staining in arteries co-localized with SM-actin staining, suggesting expression of VAP-1 in smooth muscle cells or potentially pericytes.

**Conclusions:** VAP-1 immunohistochemistry reveals a constitutive expression of VAP-1 in human ocular tissues. VAP-1 expression is exclusive to the vasculature with arteries showing higher expression than veins. Furthermore, the vessels of the optic nerve and the retina show the highest level of expression. These and our previous results suggest VAP-1 to be a key molecule in ocular vascular and inflammatory diseases.

Support: RTECH UENO, RBP, NIH grant AR05705 to A.H.-M., NEI core grant EY11404, Massachusetts LIONS Foundation, and Research to Prevent Blindness.

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**951 - D781**

**Interaction Between Vitreous-Derived Cells and Vascular Endothelial Cells in Vitreoretinal Diseases**

N. Tojo1, Y. Kashiwagi2, K. Nishitsuka3, H. Asao1, N. Sugawara1, T. Yamashita1, T. Yamamoto1, H. Yamaishi1, T. Hisatomi1, 1Dept of Ophthal and Visual Science, Yamagata University School of Medicine, Yamagata, Japan; 2Department of Veterinary Immunoology, Yamagata University School of Medicine, Yamagata, Japan; 3Mitsubishi Mediency, Tokyo, Japan.

**Background and aims:** Inflammatory cytokines are involved in the pathogenesis of retinal vascular diseases, and vitreous-derived cells may be involved. We investigated cytokine network in eyes affecting the interaction between vitreous-derived cells and vascular endothelial cells.

**Methods:** Human retinal endothelial cells, human umbilical vein endothelial cells (HUVEC) and porcine vitreous-derived cells (Nishitsuka K, et al. Exp Eye Res 2007;85:539-545.) were used. The expression of vascular endothelial growth factor (VEGF), interleukin-6 (IL-6) and tumor necrosis factor alpha (TNFα) was determined by ELISA. The effects on vascular endothelial cells by vitreous-derived cells were evaluated in a co-culture system with or without exposure to IL-1β, IL-1β, IL-6, IL-6, TNFα, tumor necrosis factor alpha (TNFα) and VEGF. The effects on vascular endothelial cells were assessed by MTT assay and tube formation.

**Results:** The expression levels of VEGF and IL-6 were increased both at mRNA and protein levels by the treatment with IL-1β, IL-1β, or TNFα, but not with VEGF or IL-6 in the vitreous-derived cells. The vascular endothelial cells were stimulated to proliferate by VEGF and IL-6. The viability of human retinal endothelial cells was affected in a co-culture system with vitreous-derived cells in the presence with IL-1β, IL-6, IL-6, TNFα, and VEGF. The tube formation using HUVEC was accelerated by IL-6 and VEGF.

**Conclusion:** The vitreous-derived cells were stimulated by the inflammatory cytokines (IL-1β, IL-1β, and TNFα) to produce VEGF and IL-6, which stimulate the proliferation of endothelial cells. These results suggest that vitreous-derived cells may act as a transitional inflammatory cytokines and vascular endothelial cells in the pathogenesis of retinal vascular diseases.

CR: N. Tojo, None; Y. Kashiwagi, None; K. Nishitsuka, None; S. Yamamoto, None; H. Asao, None; N. Sugawara, None; T. Yamashita, None; T. Yamamoto, None; H. Yamaishi, None.
Support: None.

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**952 - D782**

**First Case Report of Candida Dubligniensis Endogenous Endophthalmitis**


**Purpose:** To report the first case of Candida dubligniensis endogenous endophthalmitis in an immunocompetent individual.

**Methods / Case presentation:** 38 year old male with no significant past medical history presented with 8 week-history of pain, redness and gradual decrease in vision in his right eye. He denied trauma, uncertain procedures, procedures, intravenous drug use, or any recent systemic symptoms. Social history is significant for working in maintenance at an old school building where the ceiling of his working shop had a leak that was dripping foul liquid from the toilet alike. Two months prior to presentation, he also had to drain an abandoned indoor pool that had foul water infested with dead cats. On presentation, vital signs were normal; visual acuity in the right eye was hand motion and in the left eye was 20/20. Intraocular pressure in the right eye was 5 and in the left eye was 18. On slit lamp exam, right eye had an injected conjunctiva, but no vitreous cells or flare. Left eye had trace white nodules with no view of the posterior pole. An ultrasound showed vitreous opacity with no retinal detachment. Left eye exam was normal. Patient was immediately taken to the operating room for anterior chamber paracentesis, tap for culture, pars plana lensectomy, vitrectomy, vitreous culture and intravitreal injection of Vancomycin and Ceftazidime.

**Results:** Four days later, the anterior chamber and the vitreous cultures grew C. dubligniensis (sensitive to Amphotericin B, Flucanozole, Voriconazol, and Caspofungin). C. dubligniensis was initially identified with the commercial yeast identification system (VITEK 2ID-YST) but not with VITEK 2ID-YST and no growth pattern at 45 degrees. This was confirmed by PCR at the New York State Department of Health Wadsworth Center for Lab & Research Mycology Laboratory. Patient was treated by a intravitreal injection of Amphotericin B, topical Amphotericin B, and systemic Voriconazol 200 mg PO twice a day. He also underwent a thorough work-up for a primary source by an infectious disease specialist.

**Conclusions:** C. dubligniensis is a novel Candida subspecies that was first reported in oral candidiasis of HIV-infected individuals in 1995. This is the first case report of endogenous endophthalmitis in an immunocompetent individual. C. dubligniensis is closely related phylogenetically to C. albicans, but it is important for ophthalmic microbiology laboratories to be aware of its presence and to be able to properly differentiate it from C. albicans.

CR: R.W. Sedeek, None; M. Shah, None; R. Gentile, None; C.M. Samson, None.
Support: None.
953 - D783
Characteristics of Endophthalmitis in Patients With the Boston Keratoprostheses

Purpose: What are the characteristics of endophthalmitis in patients with the Boston keratoprostheses?

Methods: Chart review of 4 out of 35 patients who underwent keratoprosthesis implantation on the Wills Eye Cornea service from 2001-2007 and who developed endophthalmitis.

Results: All four patients underwent surgery because of failed graft. The incidence of endophthalmitis at 1 year was 14%. All of them occurred late (5-57 months). Three of the four patients had been on topical Vancomycin drops. All four patients underwent a tap and inject and were treated as inpatients for three to seven days with intensive topical and systemic therapy. Three out of four had culture positive results. Two coagulase negative Staphylococcus, one Pseudomonas and Staphylococcus aureus.

Conclusions: Endophthalmitis can occur after Boston Keratoprosthesis at a significant rate even in low risk patients on prophylactic vancomycin drops.

CR: None; B.D. Ayres3, None; J.I. Maguire4, None; A.C. Ho2, None; H.F. Chew4, None.
Support: None.

954 - D784
Bacterial Contamination Rate of the Anterior Chamber During Cataract Surgery Using Conventional Culture and Eubacterial PCR
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Purpose: To evaluate the incidence of anterior chamber bacterial contamination during phacoemulsification cataract surgery using eubacterial polymerase chain reaction and conventional cultures.

Methods: This prospective study included 30 eyes of 24 patients who had phacoemulsification with implantation of a foldable acrylic posterior chamber intraocular lens, through a 3.2-mm clear corneal incision. Topical aminoid was administered 3 days before surgery. After povideoid-iomine antisepsis, two intraoperative anterior chamber aspirates were obtained from each patient, the first taken upon entering the anterior chamber and the second at the conclusion of surgery after the suture. Broad-range eubacterial PCR amplification and conventional cultures were used to verify that aqueous humor did not contain any detectable bacteria at the beginning of the surgery and to evaluate the bacterial contamination rate of the anterior chamber at the end of it. No oral antibiotic prophylaxis was used.

Results: No specimens (0%) aspirated on entry into the anterior chamber or obtained at the conclusion of surgery were positive for microorganisms on culture or eubacterial PCR. None of the eyes developed acute endophthalmitis.

Conclusions: The incidence of anterior chamber bacterial contamination during phacoemulsification recovered in this study using eubacterial PCR and conventional culture was null (0%).

CR: P. Cornut. None; F. Vandenesch, None; G. Lina, None; Y. Benito, None; J. Etienne, None; C. Piras, None; L. Kodjikian, None; C. Burillon, None; P. Denis, None.
Support: Société Française d’Ophthalmologie.

955 - D785
Visual Outcome and Prognostic Predictors of Endogenous Fungal Endophthalmitis
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Purpose: To evaluate the visual outcome of endogenous fungal endophthalmitis in tertiary care centres.

Methods: Patients in this study were identified from the endophthalmitis data base between February 1992 and August 2002. Thirty two patients (41 eyes) had clinical evidence of endogenous fungal endophthalmitis. Twenty six (63.4%) eyes had presenting visual acuity of ≤6/60. Two patients died after presentation, one had bilateral involvement. Nineteen (19/38 (50%) eyes achieved a final visual acuity ≥6/36; 20/50 to 20/200 in 35 (30%) eyes; 20/400 to 5/200 in 17 (14%) eyes; and, ≤5/200 in 24 (20%) eyes.

Results: Overall, 50% of patients achieved a final visual acuity of ≥6/60 and 65% achieved acuity of ≥6/12. Eyes presenting with good visual acuity tended to have favorable and unfavorable visual outcomes. The presenting visual acuity was ≤6/60 in 26 (63.4%) eyes. Fungi were detected from peripheral sites only.

Conclusions: Twenty-six (63.4%) eyes had presenting visual acuity of ≤6/60. Two patients died after presentation, one had bilateral involvement. Nineteen (19/38 (50%) eyes achieved a final visual acuity ≥6/36; 20/50 to 20/200 in 35 (30%) eyes; 20/400 to 5/200 in 17 (14%) eyes; and, ≤5/200 in 24 (20%) eyes.

CR: A. Sallam, None; A. Khan, None; P. McCluskey, None; W.A. Lynn, None; N. Okhravi, None; K. Manka, None; S. Lightman, None.
Support: None.
**Table 1. AQ and V concentrations**

<table>
<thead>
<tr>
<th>Time of administration before procedure (n=number of eyes)</th>
<th>AQ</th>
<th>V</th>
<th>AQ Mean Concentrations ± SD (µg/mL)</th>
<th>V Mean Concentrations ± SD (µg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3 hours (n=5)</td>
<td>1.2 ± 1.0</td>
<td>1.7 ± 1.3</td>
<td>1.34 ± 0.52</td>
<td>1.08 ± 0.99</td>
</tr>
<tr>
<td>3.6 hours (n=5)</td>
<td>4.9 ± 2.3</td>
<td>3.29 ± 1.6</td>
<td>3.54 ± 2.94</td>
<td>1.92 ± 2.84</td>
</tr>
<tr>
<td>6.9 hours (n=5)</td>
<td>3.39 ± 1.6</td>
<td>3.74 ± 0.8</td>
<td>3.45 ± 2.08</td>
<td>2.39 ± 2.08</td>
</tr>
<tr>
<td>9.12 hours (n=5)</td>
<td>7.2 ± 6.9</td>
<td>3.91 ± 1.4</td>
<td>2.41 ± 1.39</td>
<td>2.83 ± 0.90</td>
</tr>
<tr>
<td>&gt; 12 hours (n=6)</td>
<td>3.58 ± 1.7</td>
<td>3.45 ± 2.9</td>
<td>3.29 ± 2.87</td>
<td>2.87 ± 2.87</td>
</tr>
</tbody>
</table>

CR: J. M. Joseph, None; R. G. Fiscella, Pfizer Inc; F. K. A. Redovol, Pfizer, Inc; C. Ortho McNeil Pharmaceuticals, Inc; P. A. R. Ortho-McNeil Pharmaceuticals, Inc; W. F. Mieler, None; L. Ulanski, None; J. L. Whitesides, None; N. P. Blair, None; Support: None.
696 - D791
Endophthalmitis Caused by Proteus Species: Antibiotic Sensitivities and Visual Outcomes
T. Leng, D. Miller, H.W. Flynn Jr., Bascom Palmer Eye Institute, University of Miami, Miller School of Medicine, Miami, FL.

Purpose: To report the clinical presentations, causative organisms, antibiotic sensitivities, management strategies, and visual acuity outcomes in patients with endophthalmitis caused by Proteus species.

Methods: Retrospective consecutive case series. The Bascom Palmer Eye Institute Microbiology Laboratory database was reviewed to identify all patients with intraocular cultures positive for Proteus species between 1983 and 2007. Clinical records and microbiological testing were reviewed using a data collection form.

Results: Thirteen patients were identified. Presumed etiologies for endophthalmitis included the following: cataract surgery (9), combined cataract surgery and trabeculectomy with the application of mitomycin C (1), combined glaucoma drainage device implantation with vitrectomy (1), combined vitrectomy and scleral buckle revision (1), and recurrent corneal ulcer after penetrating keratoplasty (1). Endophthalmitis developed 2-14 days postoperatively (median, 3.3 days) and patients were followed 1-6 months after presentation. 17 eyes were affected. The percentage of positive cultures ranged from light perception to 20/200. Culture results were the following: Proteus mirabilis (10) and Proteus mirabilis (3). Polymicrobial infections occurred in 4 patients (31%). Tested bacterial isolates were sensitive to the following antibiotics: amoxicillin (3 of 13), ceftazidime (2 of 2), and ciprofloxacin (8 of 8). All isolates were sensitive to the antibiotics clinically administered. Initial treatment strategies included: injection of intravitreal antibiotics alone (6) and vitrectomy with injection of intravitreal antibiotics (7). Two of the patients who received vitreectomies had either E. coli or retained nuclear remnants removed. One patient received additional antibiotic injections during the clinical course and 5 patients underwent additional surgical procedures in addition to receiving antibiotic injections. Final visual acuity was ≥20/400 in 3 patients (23%) and 7 eyes had a final visual acuity of no light perception (54%).

Conclusions: Despite prompt treatment with appropriate antibiotics, the clinical outcome for endophthalmitis caused by Proteus species is generally poor.

CR: T. Leng, None; D. Miller, None; H.W. Flynn, Alcon, C; Allergan, C; Eyetech, C; Genentech, C; Optimedia, C; Pfizer, C.
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696 - D792
Endophthalmitis Caused by Methicillin-Resistant Staphylococcus Aureus (MRSA): Antibiotic Sensitivities and Visual Outcomes

Purpose: To investigate the antibiotic sensitivities and visual outcomes of endophthalmitis caused by methicillin-resistant Staphylococcus aureus (MRSA).

Methods: A retrospective, consecutive, case series of all patients with culture proven MRSA endophthalmitis seen at the Bascom Palmer Eye Institute from January 1, 1995 - July 1, 2007 were reviewed for antimicrobial sensitivities and visual outcomes. Polymicrobial vitreous culture cases and patients with less than 3 months follow-up were excluded. In all cases, intraocular aqueous and vitreous samples were plated on Thioagar, blood, chocolate, and Sabouraud’s agar. All isolates were incubated for 18 to 24 hours in a carbon dioxide incubator at 35.5 degrees F. Test and disc diffusion were used to compare susceptibility patterns.

Results: Thirteen patients with endophthalmitis caused by MRSA were included. All isolates were sensitive to vancomycin but all were resistant to penicillin. Only 7 of 13 (54%) were susceptible to gentamicin and 8/13 (61%) were susceptible to clindamycin. MRSA isolates were 92/13 (12/13) sensitive to trimethoprim sulfamethoxazole. MRSA exhibited reduced sensitivities to older generation fluoroquinolones (ciprofloxacin 4/11 [36%] and ciprofloxacin 5/11 or 45%]). In a similar fashion, frequent resistance also occurred with the fourth generation fluoroquinolones (moxifloxacin 5/13 or 38%) and gatifloxacin 5/13 or 38%]). Median presenting VA prior to treatment was HAND Motion. Post-treatment visual outcomes of 20/400 or better occurred in 40% of patients at 3 months follow-up but 4 patients were not light perception.

Conclusions: In the current study, MRSA isolates exhibited resistance to a wide variety of antibiotics including the fourth generation fluoroquinolones. While all MRSA isolates remained sensitive to vancomycin, less than half of MRSA isolates were sensitive to the fourth generation fluoroquinolones, moxifloxacin and gatifloxacin. Visual outcomes were variable but generally poor.

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696 - D793
Efficacy of 3-Day Topical Gatifloxacin in Reducing Injection Site Flora in Patients Undergoing Intravitreal Injections

Purpose: To determine the efficacy of topical gatifloxacin in eliminating conjunctival bacterial flora following a three-day application in patients undergoing intravitreal injection.

Methods: Prospective, masked randomized evaluation of 298 eyes in 149 patients scheduled to undergo intravitreal injection. Patients were randomly assigned to study and control groups and study group participants were instructed to instill 1 drop of topical gatifloxacin QID in their injection eye for three days prior to their next scheduled intravitreal injection with control subjects using no antibiotic treatment. Cultures were taken from the bulbar conjunctiva at the injection site 3 mm posterior to the limbus (C2) and from the mirrored anatomic site on the contralateral eye (C1) on the day of the patients scheduled injection. All patients then received dilution drops and those assigned to the study group received an additional drop of gatifloxacin in their injection eye. Following the use of topical povodine iodine (PVI) and immediately prior to their injection, an additional culture was collected from the injection site (C3). Finally, the injection needle was collected and cultured (C4). Cultures were inoculated onto SeptiChek culture broth and incubated at 37°C for 5 days. Positive cultures were then gram stained for identification purposes. The individuals obtaining the cultures and analyzing the results were masked with regard to group assignment.

Results: The percentage of positive cultures following three days of topical gatifloxacin was 24% compared to 52% in untreated controls (p<0.001). PVI alone produced a drastic reduction in the percentage of positive cultures from 52% to 4% (p<0.001). Similarly PVI and 1 drop of gatifloxacin produced a further reduction from 24% to 10% (p<0.003) in pretreated study eyes. Although these pretreated eyes had a smaller bacterial load than their contralateral control eyes, 24% versus 42% (p=0.027), and received another drop of topical antibiotic prior to injection, there was no statistical difference in the rate of positive cultures between control and study participants following the use of PVI, 4% versus 10% (p=0.215). Needle cultures were not statistically different between control and study groups with 0% versus 3% (p=0.498), respectively.

Conclusions: A 3-day application of topical gatifloxacin appears to be effective at reducing the injection site bacterial load over no pretreatment. This regimen, however, conferred no increased bactericidal benefit when compared to a standard PVI preparation prior to injection.

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696 - D794
Anatomic and Visual Outcomes of Non-Infectious Endophthalmitis After Intravitreal Triamcinolone

Purpose: To describe the anatomic and visual outcomes of patients who developed non-infectious endophthalmitis following injection of intravitreal triamcinolone acetate.

Methods: A noncomparative retrospective case series was conducted in seventeen eyes of seventeen patients that developed non-infectious endophthalmitis following intravitreal triamcinolone. Evaluations of patients used Snellen visual acuity and mean foveal thickness by ocular coherence tomography. Evaluations took place on the day of injection, presentation of non-infectious endophthalmitis, time of clearance of inflammation, and on follow-up examination.

Results: Mean visual acuity and mean foveal thickness on the day of injection of intravitreal triamcinolone were 20/132 (logMAR 0.8206) and 432µm respectively. Mean visual acuity at time of non-infectious endophthalmitis (mean=1.9 days) was 20/444 (logMAR 2.3508). At follow-up (mean=57 days) visual acuity and mean foveal thickness was 20/56 (logMAR 0.4435) and 301µm respectively.

Conclusions: Visual acuity and mean foveal thickness in all patients with non-infectious endophthalmitis after intravitreal triamcinolone improved to better than pre-injection levels in this series. No patient suffered long term visual loss from non-infectious endophthalmitis. Non-infectious endophthalmitis after intravitreal triamcinolone may not exclude good visual and anatomic prognoses.

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Clinical, Anatomic and Electrophysiologic Evaluation Following Vitrectomy for Acute Post-Operative Endophthalmitis

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Purpose: To investigate clinical, anatomic, and electrophysiologic findings in patients undergoing vitrectomy and silicone oil injection for acute post-operative endophthalmitis.

Methods: Seven patients (4 females/3 males) with acute post-operative endophthalmitis (six after phacoemulsification surgery and one after intravitreal injection of anti-VEGF) were treated with vitrectomy and silicone oil injection. Silicone oil was removed three months after vitrectomy. Complete eye examination was done pre- and post-operatively. Electrotinography (Full-Field Standard ERG) and Optical Coherence Tomography (OCT, fast macular thickness, macular morphology) were performed 10 days after silicone oil removal. The pre- and post-operative visual acuity measurements, intraoperative findings, and post-operative OCT and ERG recordings were analyzed.

Results: Improvement of visual acuity (4/7 pts) was accompanied by satisfactory anatomical results, as assessed with the OCT. The presence of intraretinal hemorrhages (3/7 pts) resulted in poor visual outcome. General retinal function was compromised in all patients post-operatively as shown with the ERG testing. Rod system responses were predominantly unaffected.

Conclusions: Vitrectomy and silicone oil injection can be an effective treatment modality for preserving retinal anatomy and restoring useful central vision in Acute Post-Operative Endophthalmitis patients. However, general retinal function remains compromised. Intraocular hemorrhages are associated with poor functional prognosis. Further studies are required to assess the correlation of functional and anatomical results of the method in those patients.

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Support: None

The Risk Factors of Endogenous Endophthalmitis in Patients With Diabetes Mellitus


Purpose: To evaluate the risk factors associated the attack of endogenous endophthalmitis in patients with diabetes mellitus.

Methods: We retrospectively review medical record of 1999 to 2006 to conduct a age and sex matched case-control study that collected 29 diabetic patients with an attack of endogenous endophthalmitis (EE) to compare factors of (1) duration of diabetic history, (2) levels of diabetic control (HbA1c), (3) body mass index (BMI), (4) prevalence of hypertension, dyslipidemia, macrovascular complications, advanced nephropathy, diabetic neuropathy, and proliferative retinopathy with the 87 diabetic patients without a history of endophthalmitis (control group) from our metabolic and endocrine department. SPSS 10.0 is used for calculation in statistics.

Results: The mean age of patients is 52.5 years. Sixteen women (55%) and 13 men (45%) EE patients are included. Nearly 40% of EE were accompanied by liver involvement (66%). The EE group had a shorter duration of diabetic history in binary logistic regression. Most EE patients (89.4%) had a relatively poor blood sugar control indicated by levels (%) of HbA1c =0.006) and a relatively poor blood sugar control indicated by levels (%) of HbA1c (0.171 vs. 8.40, 95% CI of difference is 1.25 to 7.06 years, p<0.006) and a relatively poor blood sugar control indicated by levels (%) of HbA1c (10.71 vs. 8.40, 95% CI of difference is 1.28 to 3.62, p<0.001) when compared to the control group. The differences of BMI and prevalence of diabetes associated complications between groups are insignificant. However, in addition to poor sugar control (odds ratio 1.67 for every 1% increase of HbA1c, p<0.001), diabetic neuropathy is also identified to be associated with EE (odds ratio 4.15, p=0.03) after adjust for the duration of diabetic history in binary logistic regression. Most EE patients (80.3%) had no proliferative diabetic retinopathy in the fellow eye, comparable to the prevalence in control group (87.4%, p=1.00).

Conclusions: This study provides the preliminary evidence to correlate poor sugar control with the attack of endogenous endophthalmitis in diabetic patients. A majority of patients underwent EE have a relatively short diabetic history and no diabetic associated late complications such as diabetic retinopathy. The role of neuropathy in the pathogenesis of EE required further sophisticated study to clarify. To prevent the vision-destructive catastrophe of EE, early recognition of diabetes mellitus and regular blood sugar control are the most important tasks for health care professionals.

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Institute, Columbia Univ., New York, NY; Consultants NY, New York, NY.

161 patients diagnosed with AZOOR. Autofluorescence findings in MEWDS can

Conclusions: dot syndrome (MEWDS) on presentation, with small white migratory spots about the

age range was 29 - 51 years. These cases all resembled the multifocal evanescent white

Results: Methods: Sixteen eyes from eight patients with Large cells non-Hodgkin's Lymphoma

were evaluated between January 1992 and September 2007. All patients were submitted an ocular examination including

Fluorescein Angiography, Indocyanine Green Angiography and Ultrasonography.

Results: We found two forms of Retinal Pigment Epithelium Infiltration in two patients with Ocular non-Hodgkin's Lymphoma. One patient presented gray-white flecks of the Retinal Pigment Epithelium in the posterior and equatorial fundus in one eye, the patient had Systemic form of the non-Hodgkin's Lymphoma and the other patient presented multiple yellowish-tan, variable-sized and - shaped detachments of the Retinal Pigment Epithelium widely scattered throughout in the posterior pole and the macula region in one eye, the patient had Central Nervous System non-Hodgkin's Lymphoma. Conclusions: Unusual forms of the ocular fundus involvement of the Large Cells non-Hodgkin's Lymphoma were described. For Gass who described the both forms there is some overlap in the two forms of Large Cells non-Hodgkin's Lymphoma. Researchers from the National Eye Institute in the United States published different patterns of the FA confirmed by histopathologic analysis, the most common pattern were disturbances of the RPE level, they were granularity, blockage and late staining characteristica found in our cases.

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970 - D800

Long Term Outcomes of Patients With Acute Retinal Necrosis or Progressive Outer Retinal Necrosis

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Purpose: To analyze outcomes of patients with acute retinal necrosis (ARN) and progressive outer retinal necrosis (PORN) and determine what factors are associated with, or predict, long term outcome.

Methods: Retrospective chart review of all charts in the Emory system with a diagnosis of posterior uveitis. Outcomes analyzed included visual acuity and presence or absence of retinal detachment. Factors analyzed included diagnosis, quadrants of retina involved, location of involved retina, presence of anterior inflammation, presence of posterior inflammation, disc edema, immune status, and treatment regimen.

Results: 1258 charts with the diagnosis of posterior uveitis since 1995 were reviewed. Eighty-eight eyes of seventy-five patients carried the diagnosis of PORN or ARN, with sixty-nine of these eyes having complete database entries. Twenty-six eyes of twenty-one patients had complete database entries and one year or longer follow-up. The longest follow-up was one hundred months with the average follow-up being forty months for the twenty-six eyes included in this analysis.

At the most recent follow-up six eyes (23%) were 20/40 or better while sixteen eyes (62%) were 20/200 or worse. Two eyes (8%) had documented no light perception (NLP) vision. The detachment rate was 50%. Two of nine eyes (22%) with PORN detached and none progressed to NLP vision. Twelve of seventeen eyes (71%) with ARN detached and two progressed to NLP vision. Four eyes (15%) received prophylactic laser, and 3 (75%) of these eyes detached. Eleven eyes (42%) presented with 20/40 or worse vision, of these eyes only one was better than 20/200 at latest follow-up and seven (64%) were count fingers or worse. Six eyes had four quadrants of retinitis; all had 20/40 or worse vision at latest follow-up.

Conclusion: ARN and PORN remain devastating ocular infections. Retinal detachment was more common in the ARN subset (71%) versus the PORN subset (22%). Prophylactic laser barrage does not appear to prevent retinal detachment. Although the majority of visual outcomes remain poor, approximately one-quarter of patients retain 20/40 or better vision.

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971 - D801

Characterization of Type 3 Acute Zonal Occult Outer Retinopathy

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Purpose: To relate the ocular clinical findings of patients series with Large Cells non-Hodgkin's Lymphoma, including Primary Central Nervous System and Systemic form.

Methods: Sixteen eyes from eight patients with Large cells non-Hodgkin's Lymphoma

were evaluated between January 1992 and September 2007. All patients were submitted an ocular examination including Fluorescein Angiography, Indocyanine Green Angiography and Ultrasonography.

Results: We found two forms of Retinal Pigment Epithelium Infiltration in two patients with Ocular non-Hodgkin's Lymphoma. One patient presented gray-white flecks of the Retinal Pigment Epithelium in the posterior and equatorial fundus in one eye; the patient had Systemic form of the non-Hodgkin's Lymphoma and the other patient presented multiple yellowish-tan, variable-sized and - shaped detachments of the Retinal Pigment Epithelium widely scattered throughout in the posterior pole and the macula region in one eye; the patient had Central Nervous System non-Hodgkin's Lymphoma. Conclusions: Unusual forms of the ocular fundus involvement of the Large Cells non-Hodgkin's Lymphoma were described. For Gass who described the both forms there is some overlap in the two forms of Large Cells non-Hodgkin's Lymphoma. Researchers from the National Eye Institute in the United States published different patterns of the FA confirmed by histopathologic analysis, the most common pattern were disturbances of the RPE level, they were granularity, blockage and late staining characteristics found in our cases.

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972 - D802

Ocular Toxoplasmosis : Biologic Tests in Aqueous Humor


Purpose: To determine the contribution of aqueous humor analysis in the diagnosis of ocular toxoplasmosis in a cohort of patients with infectious retinchoroiditis.

Methods: Patients presenting infectious uveitis were followed in a single referral center between 2002 and 2007. To establish the causes of uveitis, patients underwent full ophthalmologic examination and laboratory blood analysis. When the causes of uveitis remained uncertain, aqueous humor analyses were performed using polymerase chain reaction (PCR), Desmont coefficient (DC) and Western Blot (WB). The diagnosis of ocular toxoplasmosis was made when at least one biologic test was positive or when clinical evolution was typical. We studied the influence of two parameters on the results of aqueous humor analysis: the delay between first clinical manifestations and aqueous humor analysis, and the retinochoroiditis size.

Results: The origin of uveitis was infectious in 45 patients and ocular toxoplasmosis was the cause of the infection in 30. Among these 30 patients, DC, PCR and WB were respectively positive in 15, 14 and 11 patients. Four patients had 3 positive tests, 9 patients 2 positive tests, 9 patients 1 positive tests, 7 patients had no positive tests. Positive results with PCR were correlated with retinchoroiditis size and were more sensitive in immunocompromised patients. If we considered PCR+ group and PCR- group, no significant statistical difference (SDD) was found concerning the delay of aqueous humor analyse whereas there was a SSD concerning the retinochoroiditis size. If we considered DC + group and DC - group, no SDD was found concerning the delay of aqueous humor analyse neither concerning the retinochoroiditis size. If we considered DC + group and DC - group, no SDD was found concerning the delay of aqueous humor analyse neither concerning the retinochoroiditis size. If we considered immunocompromised group and immunocompetent group: no SDD was found concerning the delay of aqueous humor analyse whereas there was a SSD concerning the retinochoroiditis size.

Conclusions: In immunocompromised patients, the retinochoroiditis size is more important than in immunocompetent patients and PCR is more helpful to diagnose ocular toxoplasmosis.

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Incidence of Sterile Endophthalmitis Following Intravitreal Injection of Triamcinolone Acetonide

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Purpose: To investigate the incidence of sterile endophthalmitis in patients treated with intravitreal triamcinolone acetonide (IVTA) in 2006, and to describe the clinical profile and management of these patients.

Methods: The charts of all consecutive patients treated with a single injection of IVTA (1mg/0.1mL, Kenalog-40, Bristol-Myers-Squibb) at the University of Michigan during 2006 were reviewed and cases of post-injection endophthalmitis identified. Clinical characteristics collected included: baseline best-corrected visual acuity (BCVA), indication for IVTA, interval between IVTA and presentation with "sterile" endophthalmitis, signs and symptoms of endophthalmitis, number of tap and injections performed, other endophthalmitis treatments, culture results, and final BCVA. The dates of all IVTA injections were recorded and all patients were followed for at least 60 days following IVTA injection.

Results: A total of 160 consecutive injections were reviewed. Thirteen cases of suspected "sterile" endophthalmitis were identified. Cases clustered in the summer and fall. There were no cases among the 65 injections performed in January - March or November - December. There were 13 cases identified among the 95 injections (14%) performed between April and October. The initial indications for treatment of these cases included: clinically significant diabetic macular edema (n=8), idiopathic cystoid macular edema (CME) (n=2), retinitis pigmentosa with CME (n=1), exudative Coats' disease with CME (n=1), exudative age-related macular degeneration (n=1), sympathetic ophthalmia with CME (n=1), resolved Propionibacterium acnes endophthalmitis with CME (n=1). We will also report the mean baseline BCVA, the mean interval to presentation of endophthalmitis, the presenting signs and symptoms (all patients presented with hypopyon), clinical management and the mean final BCVA.

Conclusions: During the summer and fall of 2006, there was a clustering of cases of sterile endophthalmitis following IVTA injection. Specific signs and symptoms were suggestive of a sterile intraocular inflammatory response (possibly related to the preservative benzyl alcohol) in our series. Differentiating cases of sterile endophthalmitis from infectious endophthalmitis is important in determining appropriate clinical management. The clustering of sterile endophthalmitis cases following IVTA injections in our series and those anecdotally reported by other clinicians during the summer and fall of 2006 warrants further scientific investigation.

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