ARVO 2017 Annual Meeting Abstracts

520 Endophthalmitis and trauma
Thursday, May 11, 2017 8:30 AM–10:15 AM
Exhibit/Poster Hall Poster Session

Program #/Board # Range: 5496–5522/B0678–B0704
Organizing Section: Retina

Program Number: 5496 Poster Board Number: B0678
Presentation Time: 8:30 AM–10:15 AM

Aqueous humor culture as a diagnosis tool for endophthalmitis
Daniel Rangel O Shea, Carlos Sjoholm, Virgilio Morales-Canton, Jans J. Fromow-Guerra, Raul Velez-Montoya. RETINA, ASOCIACION PARA EVITAR LA CEGUERA EN MEXICO, CIUDAD DE MEXICO, Mexico.

Purpose: Endophthalmitis is a severe sight threatening infection resulting from the introduction of an infectious agent into the eye. We report the causative incidence, visual outcomes and positive predictive value (PPV) and negative predictive value (NPV) of aqueous humour (AH) samples compared to vitreous cultures.

Methods: A retrospective observational study was conducted in which all cases with clinical diagnosis of endophthalmitis at our hospital between January 2000 and December 2014 were identified. The incidence of endophthalmitis was calculated for different causative epidemiological variables. Anterior chamber (AC) tap cultures and smears were correlated with vitreous tap samples. Visual outcomes 3 months following treatment were also studied. Two independent observers reviewed materials to confirm that cases met a standardized definition.

Results: 189 cases of endophthalmitis were recorded during the study period. Decreased visual acuity, intraocular inflammation, vitreous opacification, pain and conjunctival hyperemia were found in all patients. Postoperative cases and posterior to intravitreal injection endophthalmitis accounted for 73 and 32 eyes respectively. 83 cases were noniatrogenic (26 secondary to corneal abscess, 43 with penetrating trauma, 11 cases due to endogenous endophthalmitis and 3 cases with filtering bleb infection). The sensitivity (82.3%) and specificity (57.89%) of aqueous cultures were higher than in other studies. Positive and negative predictive values were 45.0% and 88.8% respectively. Gram-stained smear findings, where sensitivity and specificity were less then 60%, had very poor positive and negative predictive values as compared to vitreous cultures. Median visual acuity at diagnosis was 1.89 and 1.66 logMAR 3 months following intervention/treatment (p<0.01).

Conclusions: The AH culture and gram-stained smear is a poor tool in the determination of the etiology of infectious endophthalmitis. We report a poor concordance between vitreous and anterior chamber culture and smear findings. AH samples do not aid in predicting vitreous findings and should not substitute vitreous tap in infectious endophthalmitis.

Commercial Relationships: Daniel Rangel O Shea, None; Carlos Sjoholm, None; Virgilio Morales-Canton, None; Jans J. Fromow-Guerra, None; Raul Velez-Montoya, None

Program Number: 5497 Poster Board Number: B0679
Presentation Time: 8:30 AM–10:15 AM

Departmental Endophthalmitis study: Increased risk associated with iodine allergy
Riddhi Thaker, Shanthini Thivahar, Maharatanam Logendran. Eye Department, Northampton General Hospital, Northampton, United Kingdom.

Purpose: The causes of endophthalmitis are evolving, especially after increased ocular interventions including intravitreal injections and cataract operations. The purpose of this study was to report causes, clinical presentation, microbiologic spectrum and visual outcomes along with associated risk factors for suspected cases of endophthalmitis to help reduce the incidence in the future.

Methods: A retrospective case study on the suspected endophthalmitis cases was carried out. The patients were identified from the surgical register between the time period 1st August 2014 to 30th August 2016 over 25 months inclusive. The medical records were reviewed to evaluate clinical features, microbiology spectrum and treatment outcomes.

Results: 16 patients were identified. Clinical setting included post-cataract (n=3), post-intravitreal injections (n=6), post-vitrectomy (n=1), endogenous (n=2), long-term implant related (n=3) and bleb-related (n=1). All patients presented with reduced visual acuity and pain. 56% presented with hypopyon. All patients underwent an intravitreal tap and antibiotics per protocol and 63% underwent pars plana vitrectomy (n=10), of which two were diagnostic. Positive cultures were obtained in 37% (n=6 out of 16). Identified organisms were staphylococcus epidermidis (n=5) and pseudomonas aeruginosa (n=1). Most significant risk factor for patients presenting with suspected endophthalmitis after intravitreal injections was allergy to iodine (-50% (n=3) of these cases the patient was allergic to iodine and therefore iodine was not used during the procedure. In six post intravitreal endophthalmitis cases the most common bacteria was staphylococcus epidermidis, found in 83% (n=5). One patient underwent enucleation.

Conclusions: Most common cause of suspected endophthalmitis was post intravitreal Anti-VEGF injections. Most of these cases were caused by staphylococcus epidermidis, which is the normal flora of skin around the eyes. PPV was more likely to be used for post-intravitreal injection with proven staphylococcus epidermidis infection. One reason for the high incidence for endophthalmitis therefore could be iodine allergy as half of the post intravitreal cases were iodine allergic patients. Although the outcomes of visual acuity were fair, strict testing for allergy testing should be implemented to help reduce future incidences.

Commercial Relationships: Riddhi Thaker, None; Shanthini Thivahar, None; Maharatanam Logendran, None

Program Number: 5498 Poster Board Number: B0680
Presentation Time: 8:30 AM–10:15 AM

Small gauge pars plana vitrectomy for endophthalmitis after cataract surgery: clinical and OCT findings
Fiore Tito, Marco Lupidi, Carlo Cagini, Elisa Spaccini, Alessio Cerquaglia, Gabriel J. Coscas, Ophthalmology, S Marla Della Misericordia Hospital, Perugia, Italy; Centre Ophthalmologique de L’Odeon, Paris, France.

Purpose: To evaluate retinal and foveal microvasculature changes in patients treated with 25 gauge pars plana vitrectomy (PPV) for severe postcataract bacterial endophthalmitis.

Methods: A retrospective, nonrandomized, interventional case series of patients with acute and chronic postcataract bacterial endophthalmitis was performed. Diagnostic and therapeutic 25 gauge vitrectomy was performed in all eyes. Preoperative and postoperative best-corrected visual acuity (BCVA) in the study eye was performed. Spectral domain optical coherence tomography (SD-OCT) images were acquired (Spectralis HRA1 + OCT, Heidelberg Engineering, Heidelberg, Germany) to study macular thickness of both eyes for each patient. Moreover a fully automated quantitative analysis of the foveal avascular zone (FAZ), and of the total vascular and avascular surfaces (in a 1-mm-radius area) was performed using a Spectralis OCT-A (Heidelberg Engineering, Heidelberg, Germany). The

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Thirteen patients (6 men, 7 women) were included in the study. Postoperative BCVA was ≥ 20/40 in 12 eyes, ≥ 20/25 in 10 eyes, while the only eye with postoperative BCVA of 20/200 had atrophic age-related macular degeneration (AMD). Mean postoperative macular thickness was 326.18 ± 27.83 µm in the study eyes compared to 318.02 ± 27.90 µm in the fellow eyes. In the superficial capillary plexus (SCP), mean postoperative FAZ surface, total vascular and avascular surfaces were 236148 µm², 764011 µm², 2141405 µm² in the study eyes compared to 269394 µm², 663144 µm², 2209051 µm² in the fellow eyes. In the deep capillary plexus (DCP), mean postoperative FAZ surface, total vascular and avascular surfaces were 253950 µm², 726175 µm², 2141405 µm² in the study eyes compared to 281039 µm², 646394 µm², 2214200 µm² in the fellow eyes. No differences were noted between study eyes and healthy eyes (p = n.s).

Conclusions: The absence of significant structural and foveal microvascular changes on OCT and the high postoperative BCVA seem to support the idea that 25 gauge PPV may represent a successful treatment for the management of postoperative endophthalmitis following cataract surgery and may guarantee good clinical results even in long term after this severe postcataractar complication.

Commercial Relationships: Fiore Tito, None; Marco Lupidi, None; Carlo Cagini, None; Elisa Spaccini, None; Alessio Cerquaglia, None; Gabriel J. Coscas, None

Program Number: 5499 Poster Board Number: B0681
Presentation Time: 8:30 AM–10:15 AM
No Clear Benefit of Vitrectomy for Post-Injection Endophthalmitis in Age-Related Macular Degeneration
Mark Barakat, Neal Palejwala, Ashleigh L. Levison, Sujit Itty, Milad Haak, Sachin Mehta, David Goldenberg, karim jamal, Edward Quinlan, Derek Kunimoto, Pravin U. Dugel. Retinal Consultants of Arizona, Phoenix, AZ.

Purpose: With the increasing use of anti-Vascular Endothelial Growth Factor (anti-VEGF) injections for conditions such as age-related macular degeneration (AMD), post-injection endophthalmitis and its treatment is a growing concern. No clear guidelines exist as to the role of vitrectomy versus intravitreal injection of antibiotics in this setting. A review of a single center’s management and outcomes of post-injection endophthalmitis was performed.

Methods: A retrospective chart review was performed at a single institution, analyzing billing data from 1/1/2007 to 8/17/2016 and correlating it to clinic charts. Patient demographic data, visual acuities, infection source, treatment type and timing, as well as AMD treatment frequency was recorded for visits up to one year before and after onset of infection.

Results: Of the 559 unique patients identified with endophthalmitis, 134 were as a result of injections performed at the practice during this time frame, with an overall incidence ranging between 0.1% to 0.15%. Of these injections, 77 were anti-VEGF treatments given for AMD in a population of mainly pseudophakic (73%) women (62%). On average, patients lost 0.48 ± 1.0 logMAR acuity 3 months after infection and 0.53 ± 1.0 logMAR at 12 months or last observation. Eyes that underwent vitrectomy in addition to antibiotic injections 32 (41%) had significantly more vision loss at time of last observation (0.89 logMAR) compared to eyes treated with injection alone (0.29 logMAR; p = 0.04). Even vitrectomies performed within a week of antibiotic injection had a trend towards more vision loss at last observation (p = .17). Analysis of Variance demonstrated worse visual outcomes with worse vision at presentation (p = 0.01) and better outcomes with earlier initiation of steroid treatment (p = 0.04). AMD anti-VEGF treatment frequency decreased from 0.74 ± 0.23 injections per month before the onset of endophthalmitis to 0.37 ± 0.34 injections per month afterwards (p < .000000001). Multivariable linear regression of post-injection anti-VEGF treatment rates correlated with pre-infection rates and visual acuity 3 months after infections (p = 0.0000004, R² = .35).

Conclusions: Though the rate of post-injection endophthalmitis is low, it leads to significant vision loss. No clear benefit of vitrectomy over antibiotic injection alone was found, although early initiation of steroid therapy was beneficial.

Commercial Relationships: Mark Barakat, None; Neal Palejwala, None; Ashleigh L. Levison, None; Sujit Itty, None; Milad Haak, Sachin Mehta, None; David Goldenberg, None; karim jamal, None; Edward Quinlan, None; Derek Kunimoto, None; Pravin U. Dugel, None

Program Number: 5500 Poster Board Number: B0682
Presentation Time: 8:30 AM–10:15 AM
Microbial Spectrum and Antibacterial Susceptibility of Vitreous Cultures in a Tertiary Referral Center in the Midwestern United States
Brent Aebi¹, Peter Bracha¹, Thomas A. Ciulla¹, ². Ophthalmology, Indiana University School of Medicine, Indianapolis, IN; ²Midwest Eye Institute, Indianapolis, IN.

Purpose: Antibiotic resistance continues to worsen and concern has developed over resistance to vancomycin and ceftazidime in the empirical treatment of endophthalmitis. We performed a retrospective case series to investigate the microbial spectrum and susceptibility of vitreous cultures in endophthalmitis at a tertiary referral center in the Midwestern United States.

Methods: Microbiological identification and susceptibility results were obtained for endophthalmitis samples submitted to Indiana University University between April 14, 2006 and April 14, 2016. The samples were submitted by 11 local vitreoretinal surgeons from 6 different sites within Indianapolis.

Results: A total of 295 endophthalmitis vitreous specimens were processed. Of these, 96 (33%) samples grew an organism. Bacteria constituted 87.5% of identified organisms, with the remainder fungi. The most common organisms identified were coagulase negative Staphylococcus (37.5%), Streptococcus viridans (7%), Enterococcus species (6%) and Staphylococcus aureus (6%). Among gram positive organisms, forty isolates of coagulase negative staphylococcus species, enterococcus species and Staphylococcus aureus underwent susceptibility testing, of which one hundred percent were susceptible to vancomycin. Thirty four of these gram positive isolates underwent susceptibility testing for rifampin and clindamycin, of which 100% and 76% were susceptible, respectively. Among gram negative organisms, seven isolates of Pseudomonas aeruginosa, Serratia marcescens and Pantoea agglomerans underwent susceptibility testing. Of these, 100% were susceptible to cefazidime, cefepime, ciprofloxacin and levofloxacin. Susceptibility testing was not performed on beta-hemolytic streptococci, Haemophilus influenza, and Neisseria, Moraxella and Bacillus species.

Conclusions: This study, from a tertiary referral center in the Midwestern United States, shows a 100% susceptibility to the combination of vancomycin and ceftazidime in the bacterial isolates that were tested. Of note, all staphylococcal and enterococcal species were susceptible vancomycin. Limitations of this study include the large number of samples that did not undergo susceptibility testing. Despite these limitations, no evidence suggests that local resistance to vancomycin and ceftazidime has yet developed.
B0683
Purpose: Bleb-related endophthalmitis (BRE) is an uncommon but serious and potentially blinding infection that can occur at any time after glaucoma surgery. We describe the functional outcomes of patients who presented with BRE at a tertiary care center over 15 years.

Methods: A retrospective chart review of patients that presented to University Hospital, Newark, NJ with BRE from 2001-2016 was conducted. Demographics, past medical and ocular history, presenting features, treatment, microbiology, visual outcomes, and complications were recorded.

Results: 36 patients with 36 eyes (21 females) post-glaucoma surgery (30 trabeculectomies, 6 tubes) were identified. Most patients (78%) had primary open angle glaucoma; 21 were pseudophakic. Half of patients were blind in the fellow eye. Average time from procedure to onset of BRE was 4.6 years (maximum 33 years). At least 10 patients presented with blebitis an average of 6 days before developing endophthalmitis.

Mean visual acuity (VA) and intraocular pressure (IOP) at presentation were HM and 19mmHg, respectively. The most common presenting complaints were eye redness (100%), pain (97%), and decreased VA (92%). 28 of 34 patients had a hypopyon (mean height 1mm). Purulent blebitis was seen in 87% eyes. Vitritis was documented by exam or B-scan in 89% of patients. Cultures (mostly vitreous) were performed in 35 of 36 cases, 19 of which were obtained before antibiotics were started. Only 57% were positive and of those 75% were of Staph or Strep species. The treatment course and initial and final VA and IOP are shown in Table 1. All patients received intravitreal antibiotic injections (most commonly vancomycin and ceftazidime) along with systemic antibiotics (32 of 36 with IV antibiotics). 72% (n=26) of patients underwent pars plana vitrectomy (PPV) with intravitreal antibiotics. Average time to documented resolution was 15 days (n=29) from onset, with mean VA of HM and IOP of 15.3mmHg. 3 patients were enucleated and 7 were NLP. 83% had final VA worse than 20/200 at resolution. The most common complication was choroidal detachement (n=5).

Conclusions: BRE is a visually devastating infection with very poor visual prognosis. Early diagnosis and aggressive treatment with antibiotics are important to maximize visual potential.

Table 1. Treatment course with VA and IOP (T/I= tap and injection of intravitreal antibiotics, PPV= pars plana vitrectomy with intravitreal antibiotics).

<table>
<thead>
<tr>
<th>Treatment course</th>
<th>Procedure 1</th>
<th>Procedure 2</th>
<th>Procedure 3</th>
<th>n</th>
<th>Mean Initial logMAR VA (Snellen equivalent)</th>
<th>Mean Initial IOP (mmHg)</th>
<th>Mean Final logMAR VA (Snellen equivalent)</th>
<th>Mean Final IOP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUTPATIENT I/O (Antibiotics only)</td>
<td>T/I</td>
<td>--</td>
<td>--</td>
<td>2</td>
<td>2.0 (HM)</td>
<td>7</td>
<td>2.0 (HM)</td>
<td>8.8</td>
</tr>
<tr>
<td>OUTPATIENT II</td>
<td>T/I</td>
<td>T/I</td>
<td>--</td>
<td>2</td>
<td>2.25 (HM)</td>
<td>13.5</td>
<td>1.9 (HM)</td>
<td>14.0</td>
</tr>
<tr>
<td>INPATIENT I/O then IV Antibiotics only</td>
<td>T/I</td>
<td>PPV</td>
<td>PPV</td>
<td>3</td>
<td>1.82 (CF)</td>
<td>12.7</td>
<td>1.3 (10/40)</td>
<td>17.0</td>
</tr>
<tr>
<td>INPATIENT IV Antibiotics only</td>
<td>T/I</td>
<td>PPV</td>
<td>--</td>
<td>2</td>
<td>2.25 (HM)</td>
<td>14</td>
<td>2.75 (LP)</td>
<td>10.5</td>
</tr>
<tr>
<td>PPV</td>
<td>T/I</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>1.94 (HM)</td>
<td>23.0</td>
<td>1.74 (CF)</td>
<td>16.2</td>
</tr>
<tr>
<td>PPV</td>
<td>T/I</td>
<td>PPV</td>
<td>--</td>
<td>4</td>
<td>1.72 (CF)</td>
<td>28.4</td>
<td>2.00 (HM)</td>
<td>14.3</td>
</tr>
<tr>
<td>PPV</td>
<td>T/I</td>
<td>PPV</td>
<td>--</td>
<td>2</td>
<td>1.8 (CF)</td>
<td>26.0</td>
<td>1.55 (CF)</td>
<td>10.5</td>
</tr>
<tr>
<td>PPV</td>
<td>T/I</td>
<td>PPV</td>
<td>--</td>
<td>2</td>
<td>2.75 (LP)</td>
<td>36.0</td>
<td>3.0 (NP)</td>
<td>Enuc.</td>
</tr>
</tbody>
</table>

Program Number: 5502 Poster Board Number: B0684

Presentation Time: 8:30 AM–10:15 AM

Short-term safety of intracameral moxifloxacin after cataract surgery

Nelise D. Lucena, Kaline S. ferreira, Maria Isabel Lynch, Rodrigo P. Lira. Retina, Universidade Federal de Pernambuco, Recife, Brazil.

Purpose: Intracameral moxifloxacin (MFLX) have been used worldwide as an off-label option for prevention of post cataract endophthalmitis. There are some concerns related to safety. The purpose of this research to study the 5-weeks safety of MFLX after cataract surgery.

Methods: It was included a consecutive sample of 1000 cataract surgeries at our hospital between 2013 and 2016 (1000 eyes of 1000 patients). The inclusion criteria was patients with indication of cataract surgery, ≥ 55 years old, and without history of allergy to quinolones. It was excluded patients with any other ocular disease than cataract. Patients were prepared for surgery using povidone 5% solution diluted as a topical antiseptic agent. The operative technique was phacoemulsification with intraocular lens implantation. A 0.3 mL syringe was partially filled MFLX. The patients received 150-µg/0.03 mL of MFLX through the surgical incision, at the end of the surgery. Postoperatively, patients were prescribed: (1) MFLX 0.5% eyedrops 5 times daily for 1 week, and (2) prednisolone acetate 1% eyedrops 5 times daily for 1 week, followed by 4 times daily for 1 week and subsequently 2 times daily for 3 weeks. The primary outcome was incidence of acute endophthalmitis. Patients presenting with pain, hypopyon, a cloudy anterior chamber, vitritis, or loss of vision attributed to infection were given a diagnosis of presumed bacterial endophthalmitis. The secondary outcomes were mean change from baseline to 5-weeks in corneal endothelial cell density (CC), corrected distance visual acuity (CDVA – Early Treatment Diabetic Retinopathy Study letter score) and intraocular pressure (IOP). Between-group differences for two groups continuous variables were compared using the paired t-test. The P value was 2-tailed to IOP, and were 1-tailed for visual acuity and IOP. Statistical significance was set at the 0.05 level.

Results: The mean age was 67 SD 5 years. 56.4% were female. From baseline to 5 weeks, there were no significant differences among the
groups regarding mean change in CC, CDVA, and IOP (Table). No ocular or systemic adverse events were observed.

**Conclusions:** The results suggest MFLX is a safe option for intracameral use after cataract surgery.

<table>
<thead>
<tr>
<th></th>
<th>Preoperative</th>
<th>Postoperative (2 weeks)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC (pediculosis)</td>
<td>Mean 260</td>
<td>SD 101</td>
<td>27%</td>
</tr>
<tr>
<td>CDVA (ETDRS letter score)</td>
<td>60</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>CDVA (Snellen)</td>
<td>0.25±0.25</td>
<td>0.05±0.05</td>
<td></td>
</tr>
<tr>
<td>IOP (mmHg)</td>
<td>14.6±2.4</td>
<td>14.6±2.2</td>
<td>2.2</td>
</tr>
</tbody>
</table>

**Commercial Relationships:** Nelse D. Lucena, None; kaline S. ferreira, None; Maria Isabel Lynch, None; Rodrigo P. Lira, None

**Program Number:** 5503 **Poster Board Number:** B0685

**Presentation Time:** 8:30 AM–10:15 AM

**Distribution and Group Specificity of the Accessory Gene Regulon (agr) (Quorum Sensing Network) among Staphylococcus (S.) Epidermidis Endophthalmitis Isolates**

**Jack Stringham, Darlene Miller, Laura C. Huang, Harry W. Flynn.**

**Ophthalmology, Bascom Palmer Eye Institute, Miami, FL.**

**Purpose:** The accessory gene regulon (agr) in *S. epidermidis* regulates virulent factors such as biofilm and toxin expression. Pathology and host immune response have been linked to specific agr genotypes; agr1 (septicemia, colonization), agr2 (biomaterial adherence, multidrug resistance), agr3 (tissue destruction/biopsies).

We test the hypothesis that *S. epidermidis* strains recovered from different endophthalmitis presentations are correlated with unique agr quorum sensing genotypes.

**Methods:** A multiplex PCR assay was used to determine the diversity of the agr gene for 79 *S. epidermidis* isolates recovered from intraocular fluids of patients with endophthalmitis collected during 2010-2013. Group specificity/genotype was correlated with clinical disease and nonsusceptibility rates/MIC values for methicillin, moxifloxacin and vancomycin. Clinical presentations (n=64) included 41 cases associated with post-operative endophthalmitis and 23 non-operative endophthalmitis cases. Nonsusceptibility rates were determined by the Vitek2 and or E tests.

**Results:** All three agr genotypes were documented among the clinical *S. epidermidis* isolates. AGR type II (agrII) was the most frequent 48.4% (31/64) followed by agrI -40.6% (26/64) and agrIII 10.9% (7/64). Type II was the most common group associated with post-operative cases (43.9% with the highest rates identified in post cataract cases (18.8%). AgrII was also the most common group recovered from non-operative cases (52.2%, highest rate for post infections cases). Methicillin and multidrug resistance (MRSE) isolates were more frequently associated with group II (52.1%, 22/43 vs 36.1%, 13/36). Group III (agrII) was more often recovered from MSSE isolates (22.2%, 8/36 vs 4.6%, 2/43). Moxifloxacin values ranged from 0.026-12 ug/ml. MIC90 for both agrI and agrII was 4 (resistant). All tested agrI (n=9) strains were susceptible with MICs less than 1. MIC values for vancomycin ranged from 0.125-4 ug/ml, with a MIC90 of 4 (susceptible) for all agr groups.

**Conclusions:** The predominant agr genotype among *S. epidermidis* strains from both post-operative and non-operative endophthalmitis cases was agr group II. This group was more likely to be methicillin and moxifloxacin resistant and associated with higher vancomycin MICs suggestive of tolerance.

**Commercial Relationships:** Jack Stringham, None; Darlene Miller, None; Laura C. Huang, None; Harry W. Flynn, None

**Program Number:** 5504 **Poster Board Number:** B0686

**Presentation Time:** 8:30 AM–10:15 AM

**Trends of intravenous drug use associated endogenous endophthalmitis at a tertiary care center**

Preston M. Luong, Edmund Tsui, Nikhil Batra, Michael E. Zegans.

1 Geisel School of Medicine at Dartmouth, Hanover, NH; 2 Department of Ophthalmology, New York University School of Medicine, New York, NY; 3 Department of Ophthalmology, Dartmouth-Hitchcock Medical Center, Lebanon, NH.

**Purpose:** The New Hampshire Drug Monitoring Initiative estimates 488 statewide drug overdose deaths for the 2016 year, a 199% increase since 2012. The New England opioid epidemic poses a major risk factor for an increase in incidence of endogenous endophthalmitis, but it is unknown whether an actual increase in cases has occurred. We aim to investigate the trends of intravenous drug use (IVDU) associated endogenous endophthalmitis at the Dartmouth-Hitchcock Medical Center (DHMC) over the past five years and identify key historical and clinical features of these cases.

**Methods:** 13 cases of endogenous endophthalmitis from all causes were identified in the five year period from 2012-2016 within the DHMC electronic health record from searching the text string “endogenous endophthalmitis” and ICD-9 code “360.00”. Cases were manually reviewed for the following specific factors: patient IVDU, microorganism identified if available, time from symptom onset to clinical presentation, visual acuity, clinical course, and evidence of prior systemic disease from non-IVDU causes. Statistical analysis was performed using the two-tailed student t-test.

**Results:** Of the 13 cases of endogenous endophthalmitis, nine (69.2%) were IVDU associated. Four of these were observed in 2016, the year with the highest number of IVDU cases at DHMC. *Candida albicans* and coagulase-negative staphylococci were the most represented agents as identified through vitreous cultures although in six cases no causative organism was discovered. Compared with non-IVDU cases, IVDU cases involved younger patients (age 31.0±7.0 vs 62.0±15.8, p<.01) with a more delayed time from onset of symptoms to presentation (16.7±13.2 vs 1.0±1.4 days, p<.05). Five of the nine (56%) IVDU patients regained better than 20/200 vision while one of the four (25%) non-IVDU patients did so. During the course of the study, we also found IVDU patients with vision loss from non-endogenous endophthalmitis complications that included posterior uveitis and septic emboli leading to ischemia of the optic nerve and retina.

**Conclusions:** The increasing trend of IVDU-associated endogenous endophthalmitis cases in 2016 at DHMC may reflect the recent rise in opioid use in New England. Clinicians should recognize that the historical and clinical presentation of IVDU-associated endogenous endophthalmitis is distinct from that of non-IVDU causes.

**Commercial Relationships:** Preston M. Luong, None; Edmund Tsui, None; Nikhil Batra, None; Michael E. Zegans, None

**Program Number:** 5505 **Poster Board Number:** B0687

**Presentation Time:** 8:30 AM–10:15 AM

**Controlled release of vancomycin from a thermoresponsive hydrogel system for the prophylactic treatment of post-operative acute endophthalmitis**

Emily Dosmar, William F. Mieler, Jennifer J. Kang-Mieler.

1 Biomedical Engineering, Illinois Institute of Technology, Chicago, IL; 2 Ophthalmology and Visual Sciences, University of Illinois at Chicago, Chicago, IL.

**Purpose:** The purpose of this study was to investigate the efficacy of a poly(ethylene glycol) diacrylate (PEG-DA) and poly(N-isopropylacrylamide) (NIPAAm) based thermoresponsive hydrogel
drug delivery system (DDS) to deliver prophylactic vancomycin (VAN) for two weeks following ocular surgery. 

Methods: Long-Evans rats (200-250g) received an intravitreal injection of Staphylococcus aureus bacteria (5 µL ~85 CFU) to produce an acute endophthalmitis model. VAN (60 mg) was encapsulated into thermoresponsive PEG-DA and NIPAAm based hydrogel DDSs. There were four experimental groups: 1) bolus subconjunctival injection of VAN (0.08 mg/5 µL), 2) a blank DDS (5 µL), 3) saline treatment (5 µL), and 4) subconjunctival injection of the VAN DDS (0.175 mg/5 µL). VAN treatment was administered on the same day as infection induction. Animals were assessed at 12, 24, 48, and 72 hours for signs of infection progression. Eyes at 24 and 48 hours post-treatment were harvested for histology. The level of infection was evaluated by clinical scoring methods based on slit lamp examination. The cornea, conjunctiva, and vitreous were all given scores from 0-3 where 0 indicated no signs of infection and 3 indicated edemas in the conjunctiva, an opaque cornea, and no red reflex in the vitreous.

Results: At 12 hours after bacteria injection, none of the groups showed signs of a completely developed infection (infection scores of 0). However, at 24 hours, animals that received the VAN DDS had significantly lower (P<0.01) infection scores (0 ± 0) than those that received a bolus VAN injection, blank DDS, or saline. (1.5 ± 1.5, 2.3 ± 0.87, and 2.9 ± 0.25 for VAN injection, blank DDS, and bolus saline injection; respectively). At 48 and 72 hours, the VAN DDS and bolus VAN injection treatment groups performed comparably and showed significantly better (P<0.05) infection scores than the two control groups (blank DDS or saline treatment).

Conclusions: This study demonstrated that a thermoresponsive PEG-DA and NIPAAm based hydrogel DDS loaded with VAN may have promise for application as a vehicle for short term, prophylactic antibiotic ocular drug delivery.

Commercial Relationships: Emily Dosmar, None; William F. Mieler, None; Jennifer J. Kang-Mieler, Microspheres-Hydrogel ocular drug delivery (P)

Program Number: 5506 Poster Board Number: B0688
Presentation Time: 8:30 AM –10:15 AM

Clinical presentation, microbiologic profile and factors predicting outcomes in Bacillus endophthalmitis

Vivek Dave, Avinash Pathengay, Savitri Sharma, Rajeev Pappuru, Raja Narayanan, Taraprasad Das. LV Prasad Eye Institute, Hyderabad, India.

Purpose: Bacillus species include one of the commonest etiologies in endophthalmitis. Though trauma is the commonest presenting clinical scenario, the risk factors predicting treatment outcomes are unknown. In this retrospective observational case study, we describe the clinical presentation, microbiologic profile and factors predicting outcomes.

Methods: Eighty-six cases with culture proven Bacillus endophthalmitis from January 2001 to December 2015 received vitrectomy/ vitreous biopsy and intravitreal antibiotic with or without steroid as appropriate. The undiluted vitreous biopsy underwent microbiologic evaluation. The duration of symptoms, presenting visual acuity, organisms isolated, influence of intravitreal dexamethasone with intravitreal antibiotics and type of initial intervention were examined for any clinical and statistical correlation in terms of odds ratio with the final visual outcome. Favorable visual outcome was defined as vision ≥20/400 and unfavorable visual outcome when vision was < 20/400.

Results: The mean age at presentation was 25.45±19.76 years with a median of 22.5 years and range of 0.5-82 yrs. Trauma was the commonest etiology (n=75; 87.2%). Mixed infection with other bacteria was seen in 11 cases (12.79%). The mean time between onset of complaints and presentation was 4.54±8.18 days, median 1, range 0 to 45 days. All Bacillus species were sensitive to gentamicin followed by vancomycin (n=81; 94.18%) and ciprofloxacin (n=85; 98.83%). The mean follow up was 7.45±12.17 months (median 3, range 0.5-72 months). The odds ratio(OR) indicated a favorable outcome when presenting vision was greater than hand motions (OR 31.95% C.I. 2.96-323.64, p=0.004), when treatment started within 48 hours of symptoms (OR 25.95% C.I. 2.45-254.16, p=0.006), culture was non-polymicrobial (OR 18.03, 95% C.I. 0.9-344.4, p=0.054). Use of intravitreal dexamethasone and initial vitrectomy instead of a limited vitreous biopsy showed a trend towards more favorable outcome. Only 20% of all treated patients regained ambulatory vision and one fifth of all cases developed phthisis.

Conclusions: Cases diagnosed with Bacillus endophthalmitis merit aggressive vitreous intervention guided by the culture sensitivity report. Despite early and appropriate treatment, the outcomes are generally poor.

Commercial Relationships: Vivek Dave, None; Avinash Pathengay, None; Savitri Sharma, None; Rajeev Pappuru, None; Raja Narayanan, None; Taraprasad Das, None

Program Number: 5507 Poster Board Number: B0689
Presentation Time: 8:30 AM –10:15 AM

The effect of antibiotic prophylaxis on endophthalmitis rate after intravitreal injection with antiangiogenics: a meta-analysis


Purpose: For a decade, numerous studies have been conducted on the controversial use of antibiotics as prevention of endophthalmitis in intravitreal injections with antiangiogenics (anti-VEGF). Our objective is to confirm whether the use of local antibiotics is a good prophylactic treatment for endophthalmitis in patients treated with anti-VEGF.

Methods: We have conducted a search in MEDLINE over the period from January 11, 2007 to April 1, 2016. The MeSH terms used were “Endophthalmitis”, “Vascular endothelial growth factor”, “Antibiotic”, and “Intravitreal injection”. Studies were chosen in which the patients were treated exclusively with intravitreal injections of anti-VEGF agents (Aflibercept, bevacizumab, or ranibizumab) and in which intravitreal injections with corticosteroids could be excluded. Two independent reviewers extracted data and assessed the risk of bias. To assess the methodological quality of the studies, we used the Strengthening the Reporting of Observational Studies in Epidemiology Statement (STROBE) checklist for observational studies. A priori outcomes were to evaluate the incidence of endophthalmitis after treatment with anti-VEGF agents associated with use of topical antibiotics and injection site.

Results: A total of 276,774 injections, 109,178 (39.45 %) associated with the use of antibiotics and 114,821 (60.55 %) not associated with their use, were included. Our meta-analysis showed a significant risk of suffering from endophthalmitis that was 1.70 times greater with the use of antibiotics than without it, with a credibility interval from 1.09 to 2.66. (p=0.02). A meta-regression indicated that the circumstances of injection (operating rooms versus outpatient clinics) do not have a significant effect on the incidence of endophthalmitis.

Conclusions: This study involves the largest meta-analysis on this subject to date. Our results establish that the use of antibiotics in prophylactic treatment with anti-VEGF intravitreal injection

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Rhegmatogenous Retinal Detachment managed with Silicone Oil

Avinash Pathengay, Vivek Dave, Nidhi Relhan, Rajeev Pappuru, Harry W. Flynn, Taraprasad Das. LV Prasad Eye Institute, Visakhapatnam, India; *Bascom Palmer Eye Institute, Miami, FL.

**Purpose:** Management outcomes of retinal detachment in the setting of endophthalmitis using silicone oil tamponade are not well described. We performed a retrospective observational study to describe the demographics, clinical presentations, anatomic and visual outcomes of endophthalmitis with concurrent or delayed onset retinal detachment managed with silicone oil injection.

**Methods:** The patient database in the Medical Records Department with diagnosis code “endophthalmitis” and “rhegmatogenous retinal detachment” over a time period between January 1990 and December 2014 was identified. The patients were classified in group 1 – patients having RD at presentation (Concurrent RD group) and group 2 – patients developing RD during follow up (Delayed-onset RD group). All patients received silicone oil for the management of retinal detachment immediately or during follow-up. Anatomical success was defined as retina attached completely at the last visit. Functional success was defined as the best corrected visual acuity of 20/400 or better at the last visit. The data was analyzed using MedCalc ver 12.2.1.0 statistical software. A p value of <0.05 was assigned as statistically significant.

**Results:** A total of 93 patients were included in the current study. The table below describes the outcomes.

<table>
<thead>
<tr>
<th>Group</th>
<th>RD group</th>
<th>Concurrent RD</th>
<th>Delayed-onset RD</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>20</td>
<td>73</td>
<td>20</td>
</tr>
<tr>
<td>p value</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Treatment</td>
<td>Vitreous tap + IOAB</td>
<td>PPV + IOAB</td>
<td>PPV + IOAB + SOI</td>
</tr>
<tr>
<td>None</td>
<td>1/20 (5%)</td>
<td>19/20 (95%)</td>
<td>14/73 (19.2%)</td>
</tr>
<tr>
<td>55/73 (75.3%)</td>
<td>4/73 (5.5%)</td>
<td>PPV + SOI (during follow-up)</td>
<td>1/20</td>
</tr>
<tr>
<td>73/73</td>
<td>&lt;0.0001</td>
<td>Recurrent RD</td>
<td>7/20</td>
</tr>
<tr>
<td>22/73</td>
<td>0.88</td>
<td>SOR</td>
<td>9/20</td>
</tr>
<tr>
<td>35/73</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Conclusions:** Retinal detachment associated with endophthalmitis is associated with poor anatomic and visual outcomes especially in the concurrent presentation.

Support: Hyderabad Eye Institute
Methods: Of 349 consecutive patients who presented to Yale-New Haven Hospital with OGI between 2003 and 2013, charts of 206 consecutive patients with at least 6 months of follow-up were reviewed. Multivariate statistical analysis was used to identify predictors of visual outcome, number of surgical interventions required, and anatomic outcome (salvaged globe, phthisis, or enucleation).

Results: Gender was male in 72% of cases. Age (mean ± SD) was 43.5 ± 24.46 (Range 1-94). Final follow-up (mean ± SD) was 28.02 months +/- 23.27 (range 6-108). Multivariate analysis demonstrated decreased likelihood of final BCVA ≥20/40 in patients with retinal detachment (initial or delayed, odds ratio (OR) = 0.664, p = 0.0001), decreased likelihood of final BCVA ≥20/400 in patients with RAPD (OR = 0.31, p = 0.0024) or subsequent PVR (OR = 0.28, p = 0.0015), increased likelihood of NLP outcome with initial NLP (OR = 13.693, p = 0.0011) and RAPD (OR = 22.882, p = 0.0001), increased likelihood of phthisis with initial RAPD (OR = 24.860, p = 0.0060) and subsequent PVR (OR = 18.892, p = 0.0125), increased likelihood of enucleation with initial RAPD (OR = 26.476, p = 0.0040), and increased likelihood of multiple surgical interventions with age >65 (OR = 11.180, p = 0.0042), 360º subconjunctival hemorrhage (OR = 9.735, p = 0.0084), lens injury (OR = 26.405, p = 0.0001), endophthalmitis (OR = 145.468, p = 0.0190), and retinal detachment (initial or delayed, OR = 4.661, p = 0.0213).

Conclusions: Retinal detachment, PVR, and RAPD are prognostic for poor visual and anatomic outcome after OGI. Age at presentation, 360º subconjunctival hemorrhage, lens injury, retinal detachment, ocular trauma score and endophthalmitis are surgical prognostic indicators. PVR and RAPD are important predictors of phthisis.

Commercial Relationships: Jason Zhang, None; Shaheen Kavoussi, None; Tarek Alasil, None; Seth Meskin, None; Ron A. Adelman, None

Program Number: 5511 Poster Board Number: B0693
Presentation Time: 8:30 AM–10:15 AM

Retinal Detachment in Open Globe Injury with Intraocular Foreign Body
Yvonne Wang1, Seanna R. Grob1, Yewlin Chee2, Christopher Andreoli2, 1, John B. Miller1. 1Department of Ophthalmology, Massachusetts Eye and Ear Infirmary, Harvard Medical School, Boston, MA; 2Department of Ophthalmology, University of Washington, Seattle, WA; 3Ophthalmology and Visual Services, Atrius Health, Boston, MA.

Purpose: Intraocular foreign body (IOFB) represents a small subset of open globe injuries, yet can have significant visual outcome implications. We performed a retrospective clinical study to evaluate the characteristics, outcomes, and complications related to IOFBs. Particularly, we explored the relationship between IOFB location and development of retinal detachment.

Methods: 661 open globe injuries were reviewed at Massachusetts Eye and Ear, a single large tertiary ophthalmology trauma hospital, between the years of 2010 and 2015. We reviewed 57 cases of open globe repair that underwent IOFB removal. Zone of injury, IOFB location, visual acuity, mechanism of injury, and operative reports from primary repair and secondary surgeries were reviewed.

Results: 661 open globe injuries, including 57 with IOFB, presented to Massachusetts Eye and Ear between 2010 and 2016. 86% of cases with IOFB had Zone I injury, 16% had Zone II injury, and 10% had Zone III injury. The IOFB was in the cornea in 46% of cases, 47% in the anterior chamber, 23% in the lens, and 42% in the posterior segment. 88% of the patients with anterior segment IOFB had a final BCVA better than 20/100, compared to only 54% of patients with a posterior segment IOFB. The most common mechanism of injury was construction or mechanical labor, with metal as the most common IOFB material. 93% of cases had IOFB removal during the time of primary open globe repair. 5% had secondary removal of the IOFB and 2% were observed.

Pars-plana vitrectomy was used during primary open globe repair and IOFB removal in 30% of cases. Retinal detachment occurred in 28% patients with IOFBs. Of patients who had a posterior segment IOFB, 54% had a retinal detachment, and required an average of 2.4 total surgeries. Of the patients who had an anterior segment IOFB, 9% had a retinal detachment, and required an average of 1.7 total surgeries.

Conclusions: Intraocular foreign bodies pose unique challenges in the repair of open globe injuries. Retinal surgical intervention is often required. The location of IOFB is an important prognostic factor for development of a retinal detachment and worse visual outcomes. We found that a patient with a posterior segment IOFB is more likely to have a retinal detachment. Patients should be counseled regarding the additional risks and complications of intraocular foreign bodies, with a greater risk of needing subsequent retina surgical interventions.

Commercial Relationships: Yvonne Wang, None; Seanna R. Grob, None; Yewlin Chee, None; Christopher Andreoli, None; John B. Miller, None

Program Number: 5512 Poster Board Number: B0694
Presentation Time: 8:30 AM–10:15 AM

Factors Affecting Outcomes in Traumatic Eye Injuries
Hugh E. Wright1, Ellen Ngo1, Ahmed Sallam2, Horace Spencer2, Sami Uwaydat1. 1Ophthalmology, University of Arkansas for Medical Sciences, Little Rock, AR; 2Ophthalmology, North Texas Eye Center, Plano, TX.

Purpose: An often debated topic in traumatic eye injuries is the medical and surgical management after primary wound closure, including timing of secondary pars plana vitrectomy (PPV) and the benefit of systemic corticosteroids. We investigated the impact of early PPV and the use of oral prednisone (OP) on the rate of enucleation and the final best corrected visual acuity (BCVA) in open and closed-globe injuries.

Methods: This is a retrospective chart review of all globe injuries that had initial repair or exploration and subsequent PPV between 2009 and 2015. Data elements collected were vision at presentation, zone of injury, date of initial closure (primary intervention) of the open globe, timing to the secondary intervention (PPV) from initial injury, use of high dose OP, BCVA at last follow up, and rate of enucleation.

Results: This study included 87 eyes (87 patients). Mean patients’ age was 42.7 years (range: 5-90); with 71 (81.61%) males. Vision at presentation was as follows: NLP in 10 eyes (11.49%), LP to CF in 61 eyes (70.11%), and ≥ 20/400 in 10 (11.49%). Oral prednisone intake was recorded in 36 patients (41.38 %) whereas in 51 patients (58.62%) it was not documented in the chart. Nine eyes (10.34%) were enucleated. NLP vision at presentation was associated with increased risk for enucleation (p<0.0001) with 60 % of enucleated eyes having NLP vision at presentation. The use of OP did not significantly affect the rate of enucleation; 3 out of the 9 patients that underwent enucleation received OP, whereas 6 patient did not receive OP (p=0.7302; Fisher’s Exact Test). At the last follow up, 10 eyes (12.34%) had NLP vision, 38 (46.91%) has vision of LP-CF, and 33 (40.74%) had vision ≥20/400. There was a strong correlation between vision at presentation and final BCVA (Spearman correlation coefficient of 0.61099; p<0.0001). Our analysis showed that earlier secondary intervention (PPV) was associated with a better final BCVA (Spearman correlation factor of -0.23189; p = 0.0361). Use of OP did not seem to affect final visual acuity (Spearman correlation coefficient -0.06724, p = 0.5361).
Conclusions: A worse VA at presentation is correlated with a higher rate of enucleation and a worse BCVA at final follow up. Earlier PPV after globe injury may lead to better final BCVA outcomes. Despite inconsistent documentation, high dose OP does not seem to have any beneficial effect on final BCVA or rate of enucleation.

Commercial Relationships: Hugh E. Wright, None; Ellen Ngo, None; Ahmed Sallam, None; Horace Spencer, None; Sami Uwaydat, None

Program Number: 5514 Poster Board Number: B0696
Presentation Time: 8:30 AM–10:15 AM
Serendipitous insight into the pathophysiology of retinal hemorrhages in Shaken Baby Syndrome
Richard Schroeder, Susan M. Culican. Ophthalmology and Visual Sciences, Washington University in St. Louis, St. Louis, MO.

Purpose: Multiple mechanisms have been proposed for the development of retinal hemorrhages in shaken baby syndrome (SBS) including vitreoretinal traction, increased intracranial pressure, and hypoxia. This case of SBS generates the hypothesis that retinal hypoxia and vitreoretinal traction play a lesser role in the development of retinal hemorrhages. We present a case report of a child with a history of unilateral optic nerve hypoplasia and threshold retinopathy of prematurity (ROP) who suffered abusive head trauma with retinal hemorrhages only in the contralateral eye that describes a natural experiment that advances the understanding of pathophysiology in SBS.

Methods: Case Report

Results: This patient was a female infant born prematurely at 26 weeks estimated gestational age. She was followed for ROP beginning at 6 weeks of age, at which time she was noted to have optic nerve hypoplasia (ONH) in the left eye. At age 14 weeks she developed unilateral threshold ROP in the left eye that required laser therapy. By 15 weeks of age the left eye was improving while the right had complete (normal) vascularization. At age 18 weeks at the follow up ROP exam, the child was found to have widespread retinal hemorrhages in the right eye only. Subsequent workup showed diffuse bruising, broken ribs, and an admission of abuse.

Conclusions: The finding of unilateral retinal hemorrhage with contralateral optic nerve hypoplasia strongly suggests that the hemorrhage did not occur from hypoxia because the eye with a history of worsened retinopathy of prematurity would have been more affected if this were the case. Additionally, vitreoretinal traction does not seem responsible as both eyes would have been affected equally. The case suggests that the retinal hemorrhages occurred predominantly because of increased intracranial pressure which was passed through the normal left optic nerve but not through the hypoplastic right nerve.

Retinal hemorrhages in the right eye
Optic nerve hypoplasia and plus disease in the left eye

Commercial Relationships: Richard Schroeder, None; Susan M. Culican, None

Program Number: 5515 Poster Board Number: B0697
Presentation Time: 8:30 AM–10:15 AM
Prognostic Factors in Ocular Trauma and Correlation with the Ocular Trauma Score (OTS)
Alejandro Zermeno, Ricardo Moreno, Rodrigo Matsui-Serrano.
General Ophthalmology, Instituto de Oftalmología Conde de Valenciana, México City, Mexico.

Purpose: To describe demographic data, etiology, visual prognosis and correlation with the OTS in patients with ocular trauma with no prior ocular disease in an ophthalmologic center in Mexico.

Methods: A retrospective study that included patients with severe open or closed ocular trauma, meaning at least one trauma zone affected, attended in the emergency department from January 2015 to May 2016.

Inclusion criteria were all patients who had at least 6 months follow-up and no prior ocular disease.

Exclusion criteria were patients who didn’t have proper follow-up, who had other causes that could lower visual acuity, patients uncooperative to the visual acuity test or the ophthalmologic evaluation.

Results: We included 163 patients with ocular trauma, 133 men (81%) and 30 women (19%). Right eye was affected in 51% of the cases. 104 patients had closed trauma and 59 had an open globe at the moment of their first visit. The BETT was used to classify the type of trauma. The closed trauma patients were divided into blunt trauma (102 patients) and lamellar injuries (2 patients). Patients with open trauma where divided into rupture (9 patients), penetrating trauma (44 patients), perforating trauma (2 patients) and foreign intraocular body (4 patients). The trauma zones affected were 49% in Zone I, 36% in Zone II and 30% in Zone III. Eleven patients were in Group 1 of the OTS Raw Score Sum, all of them had visual acuities at 6 months of NLP or LP. Groups 2 and 3 had 25 and 27 patients, respectively, with visual acuities ranging from NLP to >20/40 in both groups. Groups 4 and 5 had mostly good prognosis with over 77% and 98% respectively, with visual acuity of 20/40 or better at the end of the follow-up. 3 patients developed endophthalmitis in this study, all of them in the open globe injury group.

Conclusions: Ocular trauma is a common diagnosis in the emergency departments of both general and ophthalmological hospitals. The initial evaluation is important to determine the prognosis and the OTS continues to be a useful tool in our population. Trauma in more than one zone was also a risk factor for low visual acuity at final visit. Open globe injury and endophthalmitis are both independent risk factors for bad prognosis.

Commercial Relationships: Alejandro Zermeno, None; Ricardo Moreno, None; Rodrigo Matsui-Serrano, None

Program Number: 5516 Poster Board Number: B0698
Presentation Time: 8:30 AM–10:15 AM
Intimate Partner Violence: an important etiology to identify in patients with open globe injuries
Seanna R. Grob1,2, Katherine E. Talcott1,3, Tomasz Stryjewski2,3, Dean Elliott1, Alice Lorch4,5, Yewlin Chee1,3, Ocular Trauma, Massachusetts Eye and Ear Infirmary, Boston, MA; Ocular Trauma, Massachusetts General Hospital, Boston, MA; Vitreoretinal Surgery, Wills Eye Hospital, Philadelphia, PA; Ophthalmology, Harvard Medical School, Boston, MA; Ophthalmology, Massachusetts Eye and Ear, Boston, MA; Vitreoretinal Surgery, Massachusetts Eye and Ear, Boston, MA; Vitreoretinal Surgery, University of Washington, Seattle, WA.

Purpose: To evaluate the prevalence and outcomes of open globe injuries resulting from acts of intimate partner violence in a large population of patients presenting with open globe injuries at Massachusetts Eye and Ear.

Methods: 390 consecutive open globes were reviewed at Mass. Eye and Ear, a single large tertiary ophthalmology trauma hospital, between the years of 2013 and 2016. 8 patients reported open globe injury related to intimate partner violence. Visual acuity, mechanism of injury, secondary injuries, initial and secondary operative reports, and complications were recorded and reviewed.

Results: 390 open globes presented to MEEI between the years of 2013 and 2016. 8 patients reported open globe injuries related to intimate partner violence with one patient presenting with bilateral open globe injuries (total 9 eyes or 2.3% of open globe injuries). All patients were female. Average age was 41 (age range 27-76 with all but one between 25-50 years old). 7 patients disclosed the relationship of the perpetrator and the mechanism of injury on initial evaluation. Visual acuity on presentation ranged from CF to NLP (with 6 of 9 eyes NLP on presentation). Mechanism of injury included blunt trauma in 3 patients and penetrating trauma in 5 patients. Four patients had associated orbital fractures and one patient had multiple other facial fractures. Four patients had facial lacerations requiring repair. All eyes underwent initial exploration and 8 out of 9 eyes were closed primarily. Two eyes underwent secondary enucleation (total 3 eyes). Three eyes required secondary vitrectomy. The best final visual acuity was 20/200 in two eyes and count fingers in one eye. 6 of 9 eyes remained NLP.

Conclusions: Ophthalmologists evaluating and treating open globe injuries should be aware of the potential etiology of intimate partner violence and should be prepared to screen for these cases. Often open globe injuries from intimate partner violence result in severe vision loss, only adding to the psychological impact of the assault. Patient safety should be immediately assessed and the appropriate referrals placed to adequately support the patient.

Commercial Relationships: Seanna R. Grob, None; Katherine E. Talcott, None; Tomasz Stryjewski, None; Dean Elliott, None; Alice Lorch, None; Yewlin Chee, None

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Emerging Fluoroquinolone Resistance Among Vitreous Biopsy Specimens at a Midwestern Tertiary Care Hospital

Adam C. Janot, Jonathan Crews, Diana V. Do. Ophthalmology, University of Nebraska, Truhlsen Eye Institute, Omaha, NE.

Purpose: In patients undergoing intraocular surgery, fluoroquinolones are commonly used as an endophthalmitis prophylaxis in the pre-operative, perioperative, and/or post-operative setting. However, emerging fluoroquinolone resistance has been reported in several clinical settings, including eye surgery. The purpose of this study is to determine fluoroquinolone resistance patterns of bacterial isolates from vitreous biopsy specimens obtained from 2000-2015 at a Midwestern tertiary care hospital.

Methods: A retrospective review of all culture-positive vitreous biopsy specimens obtained from 2000-2014 at the University of Nebraska Medical Center was conducted. Data collected included biopsy date, species, antibacterial resistance, and minimum inhibitory concentration (MIC). The specimens were divided into 5-year groups. Resistance to ciprofloxacin, moxifloxacin, levofloxacin, and gatifloxacin were compared between the three groups. Fisher Exact test was used to determine the significant difference of resistance rates between the time intervals. Changes in MIC were determined using linear regression over the 15-year study period.

Results: There were 92 culture-positive cases of endophthalmitis from 2000-2014. Coagulase negative staphylococcus represented the most commonly isolated organism (n=49), followed by viridans group streptococcus (n=13), enterococcus faecalis (n=7), staphylococcus aureus (n=9), and other gram-negative organisms (n=9). There was a statistically significant decline in sensitivity to levofloxacin (79% in 2000-2005 down to 46% in 2010-2014, p=0.005) and ciprofloxacin (63.6% in 2000-2005 down to 25% in 2010-2014, p=0.006) for all bacterial species. There were trends toward declining susceptibility to moxifloxacin and gatifloxacin over the same period (figure 1). For staphylococcal species, the MIC of levofloxacin increased over the 15-year period (r=0.39, p=0.028). Staphylococcal species also showed a trend toward increased MIC for ciprofloxacin over the same period.

Conclusions: This study demonstrates increasing resistance to second (ciprofloxacin) and third (levofloxacin) generation fluoroquinolones over a 15 year period in vitreous samples from patients with endophthalmitis. Consideration should be given to alternative antibiotic prophylaxis for intraocular surgery. Further studies into the mechanism to fluoroquinolone resistance in endophthalmitis are needed.

Inpatient Ophthalmology Consults for Fungemia at an Urban Tertiary Care Center


Purpose: There is currently much debate about the utility of routine ophthalmology consults to rule out intraocular involvement in fungemic patients, especially in the age of modern antifungals with improved ocular penetration. This retrospective observational clinical study aims to evaluate the incidence of intraocular involvement in patients with fungemia and identify predisposing risk factors in our population at an urban tertiary care hospital.

Methods: A retrospective review was performed using clinical records for all inpatient ophthalmology consults for ‘fungemia’, ‘candidemia’, and ‘rule out fungal endophthalmitis’ between the dates of January 1, 2010 and December 31, 2015.

Results: Of 94 patients (51.6 years, 75.5% male) with fungemia, 9/94 (9.6%) had chorioretinal involvement with one patient (1.1%) developing vitreous opacities. Another five (5.3%) demonstrated non-specific retinal lesions of which an infectious etiology could not be ruled out but were deemed inactive due to failure to progress over multiple examinations. Of those diagnosed with intraocular involvement, no patients communicated visual disturbances as they were either asymptomatic or intubated. 7/9 (78%) had a history of intra-abdominal surgery within the past year, 6/9 (67%) were receiving total parenteral nutrition (TPN), and 6/9 (67%) had concomitant bacteremia. All fungal isolates were subspecies of Candida with C. albicans being the most common (found in 6/9 patients [67%]). Change in management due to intraocular findings occurred in 2/9 cases (22%) and consisted mainly of optimization of antimicrobial therapy.

Conclusions: Ocular involvement in fungemia is uncommon, but if present may result in devastating visual loss. In this study, an incidence of 9.6% is consistent with prior reports. However, in our series, all patients with intraocular involvement were asymptomatic or unable to communicate suggesting that routine examination remains necessary to detect early changes and modify treatment as necessary. These results also suggest that risk factors for ocular involvement in fungemia include history of abdominal surgery, total parenteral nutrition and concomitant bacteremia.
Acute endophthalmitis can be a difficult disease to treat

Robert B. Garoon

The purpose of this study is to report the clinical etiologies, microbial spectrum, antibiotic resistance, and visual acuity outcomes associated with acute endophthalmitis at a tertiary referral center.

Method: A retrospective chart review of patients with ICD-9 and ICD-10 codes for endophthalmitis over a six year period (2011-2016) at a tertiary referral center was performed. The clinical records were reviewed to evaluate clinical etiologies, microbial spectrum, antibiotic susceptibilities and resistance, and visual outcomes.

Results: Medical records of 94 patients treated for culture-proven endophthalmitis were reviewed. The etiologies of endophthalmitis were exogenous in 68.8% of cases and endogenous in 31.2% of cases. The most common inciting factors for exogenous endophthalmitis were progression of corneal ulcer and post-operative infection after cataract extraction (22% and 17%, respectively). The microbial spectrum of causative organisms was dominated by coagulase-negative Staphylococcus (30.9%), followed by Staphylococcus aureus (23.4%) and Pseudomonas aeruginosa (10.6%). The most frequent fungal isolates were Candida species (4.3% of total samples). Antibiotic susceptibilities of Gram-positive bacteria were the following: vancomycin, 96.7%; cefazolin, 79.3%; clindamycin, 69.0%; doxycycline, 96.6%; erythromycin 55.9%; gentamicin, 96.6%; oxacillin 69.0%; penicillin G, 28.8%; and TMP/SMX 84.4%. Antibiotic susceptibilities of Gram-negative bacteria were overall very high, with greater than 90% susceptibility among isolated culture samples. Final visual acuity (VA) outcomes of 20/400 or better were reported in 62.5% of patients; counting fingers, hand motion, or light perception were reported in 10.0% of patients; and no light perception (NLP) was reported in 27.5% of patients for whom VA data was available.

Conclusions: The study demonstrates that the most frequent clinical etiology of endophthalmitis was due to progression of corneal ulcer and post-operative infection after cataract extraction. The spectrum of pathogens causing endophthalmitis is composed of mainly Gram-positive organisms, with a smaller fraction composed of Gram-negative organisms and some fungi. Visual acuity was improved in the majority of patients after treatment for endophthalmitis; nevertheless, a significant percentage of patients had a final visual acuity of no light perception (NLP).

Commercial Relationships: Louise Lu, None; Ron A. Adelman, None

Outcomes of patients treated for Open Globe Injuries with Intraocular Foreign Bodies

tanuj p bankar, Harry W. Flynn, Audina M. Berrocal, Justin H. Townsend, Thomas A. Albini. Bascom Palmer, Houston, TX.

Purpose: To analyze rates, visual outcomes (VA) and anatomical characteristics of retinal detachment after open globe injuries with intraocular foreign bodies (IOFBs).

Methods: An interventional case series from 2004 to 2015 (n=49) of open globe injuries with IOFBs that underwent repair with Pars Plana Vitrectomy (PPV) at a tertiary academic center. Eyes underwent PPV at the time of globe closure using either 20 or 23 gauge PPV instrumentation. Eyes that developed subsequent retinal detachment underwent repair with PPV with or without the scleral buckle placement. All patients with IOFB (n=49) received prophylactic intravitreal antimicrobials (Vancomycin/Ceftazidime ± Amphotericin) during repair.

Exclusion criteria included patients under 18 years of age, eyes with unknown foreign bodies, and eyes undergoing primary enucleation. Pre-operatively, presence of an IOFB was confirmed direct clinical exam and with either a CT scan and/or a B-scan.

Results: The mean presenting VA was 20/1000 (logMAR 1.67) improving to 20/400 (logMAR 1.26) post-operatively (P<.03). The mean age of patients was 37.3 ± 11.29 years. Of the IOFBs, 70% (n=35/49) were metallic and 22% (n=11/49) were glass. 30.6% (n=15/49) had retinal detachments (RDs) or retinal breaks. Eyes with a RD had a final VA of 20/1000 (logMAR 1.84 ± 1.05) compared to 20/100 (logMAR .77 ± 1.24) in eyes without RD/retinal breaks (p<.01)

Conclusions: Visual outcomes depend on the extent and nature of the injury. Eyes with a retinal detachment had poorer visual outcomes compared to eyes without a retinal detachment

Commercial Relationships: tanuj p bankar, Harry W. Flynn, None; Audina M. Berrocal, None; Justin H. Townsend, None; Thomas A. Albini, None

Post-Operative Visual Outcomes after Pars Plana Vitrectomy for Open Globe Injuries

Darlene Miller, Ron A. Adelman

Purpose: To analyze rates, visual outcomes (VA) and anatomical characteristics of retinal detachment after open globe injuries with intraocular foreign bodies (IOFBs).

Methods: A single surgeon retrospective chart review to report on a series of endophthalmitis cases which were proven to be secondary to infection by Staphylococcus lugdunensis. We performed a retrospective chart review to report on a series of endophthalmitis cases which were proven to be secondary to infection by Staphylococcus lugdunensis.

Results: Staphylococcus lugdunensis was isolated in microbiologic cultures in all eight cases. In 63.5% (5/8) cases, oxacillin resistance was identified with MIC >4 in all cases. Of the eight cases, 87.5% were sensitive to ciprofloxacin with an MIC <0.5, however one case showed ciprofloxacin resistance with an MIC >8. Each culture showed sensitivity to levofloxacin and moxifloxacin with MIC values of <0.25 and 0.25, respectively. All isolates were sensitive to vancomycin with MIC values ranging from <0.5 to 1.

Conclusions: Acute endophthalmitis caused by Staphylococcus lugdunensis can be confirmed by microbiologic cultures. It is important to choose an appropriate anti-microbial agent in treating Staphylococcus lugdunensis as isolates generally show sensitivity to vancomycin but can be resistant to oxacillin and rarely ciprofloxacin.

Commercial Relationships: Robert B. Garoon, None; Darlene Miller, None; Harry W. Flynn, None

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Presentation Time: 8:30 AM–10:15 AM
Visual outcomes of endophthalmitis patients who underwent pars plana vitrectomy in regards to microbiology culture status
Chang Sup Lee¹, Asima Bajwa¹, Jim Patrie², Miraj Khan¹, Yevgeniy Shildkrot¹. ¹Ophthalmology, University of Virginia, Charlottesville, VA; ²Department of Public Health Sciences, University of Virginia, Charlottesville, VA.

Purpose: To compare the visual outcome of culture positive and culture negative endophthalmitis patients who underwent pars plana vitrectomy (PPV) at a tertiary eye center in central Virginia.

Methods: Retrospective, observational study of 32 patients (50% male) who underwent PPV at the University of Virginia from 2000-2014. Mean age was 67.1 years (SD=17.8) [range: 22.8 to 93.7 years] at the time of surgery. All patients with a minimum of 1 month follow up and vitreous biopsy culture data were included. Linear mixed models were utilized to compare best-corrected visual acuity (BCVA) as measured by logMAR between culture-positive and culture-negative individuals with adjustments for age and pre-surgery BCVA.

Results: Twenty-six (81%) out of 32 cases were positive for culture. The mean BCVA logMAR for individuals with culture-negative endophthalmitis was 2.70 (95% CI:2.06, 3.34) at pre-surgery state and 0.38 [-0.66, 1.42] after 12 months of surgery. The mean BCVA logMAR for individuals who had positive microbiology cultures was 2.58 [2.26, 2.90] at pre-surgery state and 1.67 [1.11, 2.24] after 12 months of surgery (Table 1).

After adjustment for patient age and pre-surgery BCVA, there was a significant association between post-operative BCVA and microbiology culture status (p<0.001). Further analysis after Bonferroni correction for multiple comparisons revealed that the post-operative mean BCVA logMAR at 1 and 3 months were significantly greater for individuals who had a positive microbiology cultures than for individuals who had negative cultures (P=0.002, and P=0.003, respectively). At month 12, mean BCVA was marginally greater for the individuals who had a positive microbiology cultures than for individuals who had negative cultures (P=0.069) (Table 2).

Conclusions: Individuals with culture-negative endophthalmitis showed significantly greater improvement in BCVA when compared to those with culture-positive results. The BCVA differed between culture positive and culture negative individuals at month 1 (p=0.002) and month 3 (p=0.003) and marginally at month 12 (p=0.069).

<table>
<thead>
<tr>
<th>Time</th>
<th>Culture Status</th>
<th>n</th>
<th>Mean logMAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Surgery</td>
<td>Negative</td>
<td>6</td>
<td>2.70 [2.06, 3.34]</td>
</tr>
<tr>
<td>Day 1 Post-Surgery</td>
<td>Negative</td>
<td>26</td>
<td>2.58 [2.26, 2.90]</td>
</tr>
<tr>
<td>Day 7 Post-Surgery</td>
<td>Positive</td>
<td>5</td>
<td>2.26 [1.49, 2.90]</td>
</tr>
<tr>
<td>Month 1 Post-Surgery</td>
<td>Negative</td>
<td>26</td>
<td>2.58 [2.23, 2.90]</td>
</tr>
<tr>
<td>Month 3 Post-Surgery</td>
<td>Positive</td>
<td>26</td>
<td>2.15 [1.63, 2.48]</td>
</tr>
<tr>
<td>Month 12 Post-Surgery</td>
<td>Negative</td>
<td>26</td>
<td>1.64 [1.52, 2.17]</td>
</tr>
</tbody>
</table>

Table 1. Unadjusted mean BCVA logMAR (i.e. not adjusted for age and pre-surgery logMAR).

<table>
<thead>
<tr>
<th>Time</th>
<th>Comparison</th>
<th>Difference in Mean logMAR [95% CI]</th>
<th>Bonferroni Corrected p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1 Post</td>
<td>Positive - Negative</td>
<td>0.40 [0.57, 1.29]</td>
<td>1.000</td>
</tr>
<tr>
<td>Day 7 Post</td>
<td>Positive - Negative</td>
<td>0.69 [0.29, 1.05]</td>
<td>0.348</td>
</tr>
<tr>
<td>Month 1 Post</td>
<td>Positive - Negative</td>
<td>1.34 [0.90, 2.31]</td>
<td>0.002</td>
</tr>
<tr>
<td>Month 3 Post</td>
<td>Positive - Negative</td>
<td>1.27 [0.83, 2.71]</td>
<td>0.003</td>
</tr>
<tr>
<td>Month 12 Post</td>
<td>Positive - Negative</td>
<td>1.36 [0.67, 2.75]</td>
<td>0.069</td>
</tr>
</tbody>
</table>

Table 2. Age and pre-surgery BCVA logMAR adjusted comparisons of post-surgery BCVA logMAR between culture positive and culture negative individuals.

Commercial Relationships: Chang Sup Lee, None; Asima Bajwa, None; Jim Patrie, None; Miraj Khan, None; Yevgeniy Shildkrot, None

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