Fundus Findings, SD-OCT Characteristics, Treatment and Outcomes of an Outbreak of Post-Viral Fever Retinitis in Southern India: Interim Results

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OBJECTIVE To assess fundus findings and optical coherence tomography (OCT) characteristics that predict visual outcomes and change in central macular thickness (CMT) in patients of post- viral fever retinitis.

PURPOSE Retinal necrosis in post- viral fever retinitis can lead to severe visual loss. Hyper reflective inner layers (HRL), neurosensory detachment(NSD), Spongy edema and cystoid spaces are the characteristic features on OCT which lead to poor visual outcomes. Identification of prognostic factors on fundus imaging helps in understanding disease characteristics,management and resolution

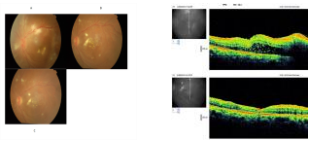
METHODS An interventional case series of 36 eyes (27 patients) with ocular inflammation from August to Nov 2015, preceded by serologic/RT-PCR proven viral fever were included. Baseline BCVA (log MAR), IOP, fundus findings were noted. Presence of retinal necrosis, cotton wool spots, superficial hemorrhages, macular star and disc edema were recorded.SD-OCT characteristics were noted as 1)quantitative- CMT in μm,2)Qualitative- presence of HRL, NSD, spongy edema and cystoid spaces. All patients received either intravitreal bevacizumab(IVB 1.25 mg) or Triamcinolone

Acetonide(IVTA 1mg). Post injection BCVA, IOP, fundus and SD-OCT findings were noted at day 7, day 30, day 40 & day 60 respectively.

RESULTS 36 eyes of 27 patients (OU in 9 patients) were analysed. Longest follow up-158 days. All patients had viral illness 28.89±15.24 days prior. Mean baseline BCVA was 1.64±1.02. Fundus examination showed retinal necrosis(77.78%),superficial hemorrhages(72.22%)& macular star/fan (41.67%).Mean CMT 537.69±193.12µ;hyper-reflective inner layers in 25(69.44%),NSD in 24(66.67%),cystoid spaces in 18(50%),spongy edema in 25(69.44%).28 eyes received IVB & 8 IVTA. Mean CMT reduction was 316.14±191.56µ at day 60. Mean BCVA at day 60 was 0.57±0.58(p<0.001).Eyes with retinal necrosis had worse final BCVA(0.67±0.59,p-0.023), those with macular star had better final BCVA(0.26±0.23,p-0.004).Mean BCVA was better with IVB(0.45±0.40)compared to IVTA(0.96±0.89);p-0.013. Mean CMT reduction was better in eyes with cystoid spaces (383.78±204.36µ,p 0.016),NSD(383.88±172.48µ,p-<0.001) and spongy edema(358.04±174.25µ,p- 0.023). Eyes with hyper reflective inner layers had worse BCVA (0.65±0.62) (p- 0.049)

CONCLUSION Presence of retinal necrosis & macular star at presentation are useful in predicting visual outcomes. NSD, spongy edema and cystoid spaces at presentation lead to better reduction in CMT. HRL on OCT portends worse BCVA. Intravitreal Bevacizumab is a good, one time treatment for post- viral fever retinitis. A novel classification system can be coined based on larger samples and longer follow up.

TAKE HOME MESSAGE Fundus findings and SD- OCT characteristics can help predict anatomical and functional outcomes in post- viral fever retinitis.



HUMAN RESEARCH This study involves human research.
IRB Approval Status: Approved by institutional review board

Sarilumab for Noninfectious Uveitis (SARIL-NIU): Interim Results From the SATURN Study

- David Callanan, MD

OBJECTIVE To demonstrate efficacy and safety of sarilumab, a fully human monoclonal antibody against the alpha subunit of the IL-6 receptor complex, for posterior segment non-infectious uveitis.

PURPOSE Interleukin-6 (IL-6) and its soluble receptor are detected in the vitreous and aqueous humors of patients (pts) with uveitis. An exploratory study was conducted to evaluate the efficacy and safety of sarilumab, an investigational human anti-IL-6 receptor monoclonal antibody, in the management of posterior non-infectious uveitis (NIU).

METHODS SATURN (NCT01900431) is a 52-week multicenter, double-masked, placebo-controlled, parallel-arm trial in which 58 pts with posterior NIU were randomized (2:1) to sarilumab (200 mg) administered SQ every 2 weeks or matching placebo (Figure 1). All pts were receiving a stable dose of systemic steroids of at least 15 mg/day at baseline. The primary endpoint, assessed at week 16, is the proportion of pts with a ≥ 2-step reduction in vitreous haze (VH per reading center) in the study eye or a dose of systemic corticosteroid <10 mg/day. Secondary endpoints assessed at week 16 included the change from baseline in: VH, macular edema, and best-corrected visual acuity (BCVA).

RESULTS Baseline characteristics were balanced between groups (Table 1). The Principal Treatment Period (Part A–Week 16) has been completed; Parts B and C are ongoing. At week 16, the combined estimate of the proportion of pts with a ≥ 2-step reduction in VH or steroid dose <10 mg/day was significantly higher in the Sarilumab group vs placebo when VH was assessed by the Investigator (64.0% vs 35.0%; p=0.0372) and numerically

higher when measured by a reading center (46.1% vs 30.0%; p=0.2354). Secondary outcomes at week 16 included a greater mean change in VH score (per reading center) in the sarilumab group vs placebo (LS mean difference: -0.74 [SE: 0.286]; 90%CI: -1.223 to -0.262; p=0.0127) and improved BCVA (8.51 vs 3.87 ETDRS letters; LS mean difference: 4.65 [SE: 2.118]; 90%CI: 1.091 to 8.201; p=0.0333). SAEs were reported in 2 Sarilumab pts (neutropenia (n=1) and abortion induced (n=1) and in 1 placebo patient (having both staphylococcal sepsis and deep vein thrombosis (n=1).

CONCLUSION The Saturn Study provides evidence that inhibition of IL-6 signaling may be efficacious in the management of posterior segment NIU. The study is ongoing and results at week 52 are pending.

TAKE HOME MESSAGE SATURN is a multicenter trial in patients with posterior uveitis and at 16 weeks demonstrated improved outcomes with sarilumab (200 mg) administered SQ every 2 weeks compared with placebo.

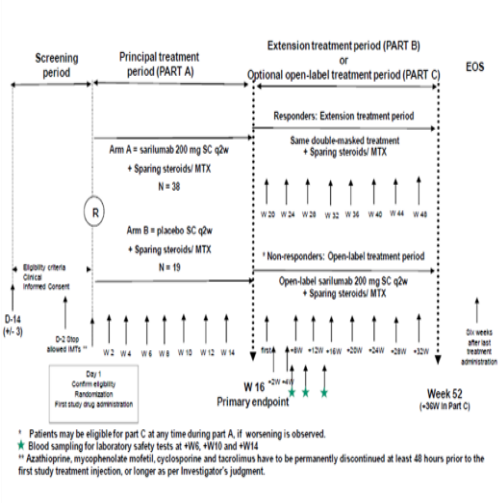


Table 1 Baseline Characteristics

	Placebo q2wk N=20	Sarilumab 200 mg q2wk N=38
Mean age (SD)		
Years	41.5 (13.0)	39.3 (15.3)
Min:Max	22 : 62	18 : 73
Gender n(%)		
female	7 (35.0%)	15 (39.5%)
male	13 (65.0%)	23 (60.5%)
Race n(%)		
White	20 (100%)	34 (89.5%)
Black	0	4 (10.5%)
Active disease n(%)	19 (95.0%)	36 (94.7%)
Recently active disease n(%)	1 (5.0%)	2 (5.3%)
Uveitis etiology n(%)		
Idiopathic	13 (65.0%)	25 (65.8%)
Systemic	7 (35.0%)	13 (34.2%)
Vitreous Haze (Adjudicated)* n(%)		
VH<4	17 (85.0%)	32 (84.2%)
VH≥4	3 (15.0%)	6 (15.8%)
Central Retinal Thickness n(%)		
<300 µm	9 (45%)	20 (52.6%)
≥ 300 µm	11 (55%)	18 (47.4%)

* J Davis/Miami 9-step scale

HUMAN RESEARCH This study involves human research.
IRB Approval Status: Approved by institutional review board

A Randomized, Masked, Controlled, Safety and Efficacy Study of an Injectable Fluocinolone Acetonide Intravitreal Insert in Non-Infectious Uveitis

- Glenn J. Jaffe, MD

OBJECTIVE To determine the efficacy and safety of an injectable fluocinolone acetonide implant (FAi) in eyes with intermediate, posterior, or panuveitis.

PURPOSE To determine the feasibility, efficacy, and safety of a long-acting fluocinolone acetonide implant (FAi) injected in an office-based setting to treat chronic non-infectious intermediate, posterior or panuveitis. We hypothesized that the implant would control inflammation, and have a favorable safety profile, when compared to sham injection.

METHODS **Design**: prospective, sham-controlled, double-masked, prospective, phase III clinical trial. **Participants:** Patients with intermediate, posterior, or pan-uveitis requiring either repeated local corticosteroid injections, or systemic steroids or other immunomodulatory therapy, or who had at least 2 recurrences, in the preceding one year. Eyes were randomized 2:1 to receive, in the outpatient clinic, a FAi or sham injection, respectively. Patients were observed on day 1, 7, and 28, and on month 2, 3 and 6. **Main Outcome Measures:** 6-month efficacy: proportion of patients with study eye uveitis recurrence. 6-month safety: ocular and systemic adverse events

RESULTS 129 eyes of 129 patients were enrolled (87 FAi-treated, 42-sham). At 6 months among FAi-treated compared to sham treated eyes, 18.4% vs. 78.6% had a uveitis recurrence (P<0.000000001). In the FAi-treated group, compared to the sham group, the baseline, 6 month and change in BCVA (ETDRS letters) was 66.9, 73.5, and +6.6 vs. 64.9, 66.7, and +0.8, respectively, 23% vs. 4.9% had a 3-line BCVA improvement (p=0.01), 4.6 % vs. 31% eyes lost 3-lines VA (p<0.0001). In these same groups, 52% vs. 18.2% patients were able to eliminate systemic treatment, the baseline, 6-month, and change in IOP was 13.0, 15.8, +1.9 vs. 13.6, 14.1, +0.5, 27.6 % vs. 16.7% had IOP > 21 on > 1 visit, 2.3% vs 0% required incisional surgery to reduce IOP and 9.5% vs. 4.8% required cataract extraction.

CONCLUSION A long-acting FAi can be implanted in the clinic to treat uveitis affecting the posterior segment, without persistent procedure-related AEs. The FAi effectively controls inflammation over at least 6 months, with a favorable safety profile. The FAi sustained drug delivery implant is a promising new treatment approach for patients with non-infectious intermediate, posterior, or panuveitis.

TAKE HOME MESSAGE A long-acting fluocinolone acetonide implant can be injected in an oupatient clinical setting, and very effectively controls intermediate, posterior, and panuveitis with acceptable side effects.

HUMAN RESEARCH This study involves human research.
IRB Approval Status: Approved by institutional review board

Endophthalmitis After Vitrectomy Surgery: A Case Control Analysis

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- Christina E. Choi
- Gayatri S. Reilly, MD
- Alexander Melamud, MD, MA

OBJECTIVE To evaluate the potentials risk factors and/or protective measures for post-operative vitrectomy endophthalmitis.

PURPOSE To evaluate the risk factors for post-operative endophthalmitis associated with pars plana vitrectomy surgery (PPV) and to evaluate the presenting characteristics, prognosis, and visual outcomes of this population.

METHODS This is a nested case-control retrospective review of 182 patients who underwent vitrectomy surgery between January 2005 and January 2015. 32 cases with post-operative endophthalmitis after PPV were compared to 150 randomly selected controls. Cases and controls were identified using a large database of individuals who underwent vitrectomy in an outpatient setting. Patients were excluded if endophthalmitis presented more than 6 weeks after PPV or the duration of follow up was less than 3 months. Five risk factors were chosen for analysis: presence of post-operative hypotony, use of suture, use of sub-conjunctival antibiotics, use of endotamponade, and small versus large gauge vitrectomy.

RESULTS The use of endotamponade was identified as the only variable with a significant impact on the risk of developing endophthalmitis. The odds of disease for patients undergoing vitrectomy with endotamponade were 85% lower than the odds for those in whom endotamponade was not used. Post-operative hypotony, surgical gauge, use of suture, and use of periocular antibiotic did not modify the risk of developing the disease. For the endophthalmitis group, the average time to presentation was 5 days post vitrectomy (1-23 days). 30/32 (93.75%) presented with a/c cell/fibrin, 13 (40.63%) with hypopyon, and 4 (12.50%) with complaints of floaters. 22/31 (74.19%) patients

presented with complaints of pain, 17/27 (62.96%) with corneal edema, and 23/24 (95.83%) with vitreous cell/fibrin.50% (16/32) required further surgery, of swhich 5/32 (15.6%) were for endophthalmitis. Visual acuity improvement at one-year follow up was statistically significant (p <0.001).

CONCLUSION This is the largest case-control study on the topic of endophthalmitis after PPV and the first review to demonstrate that the use of endotamponade lowers the risk of disease. We found that other variables had no effect on the risk of disease. Visual acuity improved in the cohort at one-year follow up.

TAKE HOME MESSAGE The use of an endotamponade agent decreases risk of endophthalmitis for patients undergoing vitrectomy.

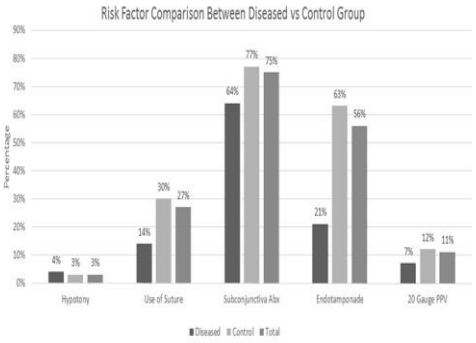

Table 1. Summary of the analyzed patients according to risk factor

	Diseased	Non-diseased	Total
Variables:	(n=28)	(n=135)	(n=163)
Post-op hypotony			
N	96%(27)	97%(131)	97%(158)
Y	4%(1)	3%(4)	3%(5)
Suture			
N	86%(24)	70%(95)	73%(119)
Y	14%(4)	30%(40)	27%(44)
Post-op subconjunctival ABX			
N	36%(10)	23%(31)	25%(41)
Y	64%(18)	77%(104)	75%(122)
Endotamponade*			
N	79%(22)	37%(50)	44%(72)
Y	21%(6)	63%(85)	56%(91)
Large vs. Small			
Large	7%(2)	12%(16)	11%(18)
Small	93%(26)	88%(119)	89%(144)

(n): Specifies number of eyes.
*: Statistical significance p < 0.001

HUMAN RESEARCH This study involves human research.
IRB Approval Status: Approved by institutional review board

Persistently Vitreous Culture-Positive Exogenous Endophthalmitis

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- Ajay E. Kuriyan, MD, MSc
- Harry W. Flynn, MD
- Darlene Miller, DHSc
- Laura C. Huang, MD

OBJECTIVE To determine the etiologies and visual outcomes of patients with persistent exogenous endophthalmitis after intravitreal therapy.

PURPOSE To identify the microbial isolates, clinical settings, and clinical outcomes of patients with persistently vitreous culture-positive exogenous endophthlamitis after treatment.

METHODS Retrospective case series of all patients with exogenous endophthalmitis who had the same microbial organism on at least two consecutive vitreous cultures treated at the Bascom Palmer Eye Institute from 1981-2015. All patients were treated with at least one intravitreal injection of antibiotics. Exclusion criteria included polymicrobial vitreous cultures and endogenous infections. A total of 49 eyes in 49 patients were included.

RESULTS Of the 49 patients, thirty-three had bacterial (67%) and 16 had fungal endophthalmitis (33%). The mean age was 68 years old, with a mean follow-up of 31 months (range: 1-288 months). The most common bacterial isolates were *Staphylococcus* species (11/49, 23%), *Streptococcus* sp. (9/49, 18%), and *Enterococcus* species (5/49, 10%). The most common fungal isolate was *Candida* sp. (2/49, 4%). Endophthalmitis most commonly occurred after cataract surgery (26/49, 53%), glaucoma surgery (13/49, 26%), and trauma (5/49, 10%). There was no statistically significant difference between the mean presenting and final visual acuities (2.02 ± 0.82

logMAR, Snellen equivalent≈ 20/2100, vs. 2.00 ± 1.0 logMAR ≈20/2000, p=0.87, respectively). Patients with bacterial and fungal endophthalmitis had similar vision. The final visual acuity was 20/200 or better in 13 patients (27%) and no light perception in 14/49 patients (29%).

CONCLUSION The most common isolate in persistent endophthalmitis was gram positive bacteria, and the most common clinical setting was after cataract surgery. Patients with persistent endophthalmitis had poor visual outcomes.

TAKE HOME MESSAGE Persistent endophthalmitis is most commonly associated with gram positive bacteria and occured most frequently after cataract surgery. Patients generally have poor visual outcomes.

HUMAN RESEARCH This study involves human research.
IRB Approval Status: Approved by institutional review board

The Effects of Intravitreal Sirolimus on Inflammation in Non-Infectious Intermediate Uveitis: Results from SAKURA Study 1

- Pauline T. Merrill, MD
- Quan Dong Nguyen, MD, MSc
- W. Lloyd Clark, MD

OBJECTIVE To evaluate the role of intravitreal sirolimus in reducing vitreous haze in patients with non-infectious intermediate uveitis.

PURPOSE To evaluate the effects of intravitreal sirolimus, an mTOR inhibitor, injected every 2 months as a novel immunoregulatory therapy in the subset of SAKURA Study 1 subjects with non-infectious intermediate uveitis.

METHODS SAKURA Study 1 is a phase 3, double-masked, multinational study of intravitreal sirolimus monotherapy in active non-infectious intermediate, posterior, or panuveitis. A total of 347 subjects with baseline vitreous haze (VH) scores >1+ in the study eye were randomized to injections of intravitreal sirolimus 44 μg (active control), 440 μg, or 880 μg on Days 1, 60, and 120. Efficacy at Month 5 was mainly assessed by VH response endpoints, including the primary endpoint of VH 0 response and a key secondary endpoint of VH 0 or 0.5+ response. Subjects rescued before Month 5 were treated as non-responders. This analysis evaluates VH responses in the subgroup of subjects with intermediate uveitis.

RESULTS Of the 347 subjects in the Intent-to-Treat (ITT) population, 118 had a diagnosis of intermediate uveitis. At Month 5, the proportion of these 118 subjects achieving the primary endpoint (VH 0) was 7.0% for 44 μg, 24.3% for 440 μg (p=.056 vs 44 μg), and

26.3% for 880 µg (p=.031 vs 44 µg). The proportion achieving VH 0 or 0.5+ was 27.9% for 44 µg, 54.1% for 440 µg (p=.023 vs 44 µg), and 57.9% for 880 µg (p=0.008 vs 44 µg). Response rates were higher in this subgroup than in the overall ITT population. The mean VH change from baseline at Month 5 was -0.77 for 44 µg, -1.17 for 440 µg (p=.02 vs 44 µg), and -1.13 for 880 µg (p=.037 vs 44 µg). Safety was similar to the overall Safety population; the most common ocular adverse events (AEs) in study eyes in this subgroup were iridocyclitis (22.9%), conjunctival hemorrhage (16.9%), and intermediate uveitis (13.6%). Ocular serious AEs occurred in 8.5% of subjects, including 1 case of non-infectious (sterile) endophthalmitis in the 880 µg group.

CONCLUSION In SAKURA Study 1, significantly more non-infectious intermediate uveitis subjects receiving 440 or 880 µg injections of intravitreal sirolimus showed improvement in VH compared with subjects receiving 44 µg. In patients with non-infectious intermediate uveitis, this local mTOR inhibitor may provide a new treatment option.

TAKE HOME MESSAGE Every-other-month injections of intravitreal sirolimus, a local mTOR inhibitor, significantly reduced vitreous haze in subjects with non-infectious intermediate uveitis participating in SAKURA Study 1.

HUMAN RESEARCH This study involves human research.
IRB Approval Status: Approved by institutional review board

Intravitreal Sirolimus Effects on Vitreous Haze and Visual Acuity in Noninfectious Uveitis of the Posterior Segment: 12-Month SAKURA Study 1 Results

- Sunil Srivastava, MD

OBJECTIVE To evaluate the effects of intravitreal sirolimus on vitreous haze and visual acuity through 12 months in subjects with non-infectious uveitis of the posterior segment participating in SAKURA Study 1.

PURPOSE To present vitreous haze (VH), best corrected visual acuity (BCVA), and safety outcomes at Months 5 and 12 for intravitreal sirolimus, a local mTOR inhibitor currently being investigated for the treatment of active non-infectious uveitis (NIU) of the posterior segment in SAKURA Study 1, a randomized, multinational, 24-month, phase 3 study

METHODS 347 subjects with active NIU of the posterior segment (VH score >1+ in the study eye at baseline) were randomized 1:1:1 to receive injections of intravitreal sirolimus 440 μg (n=114), 880 μg (n=116), or an active control dose of 44 μg (n=117). Injections were administered every 2 months. At Month 6, subjects transitioned to an open-label treatment period during which they received injections of 880 μg every 2 months through Month 10. VH response rates (the proportion of subjects achieving VH=0 or VH=0 or 0.5+) were assessed at Month 5, the primary efficacy endpoint, and Month 12. BCVA changes, use of rescue therapy, and adverse events (AEs) were also reported through Month 12.

RESULTS At Month 5, the proportion of subjects achieving VH=0 was 22.8% for 440 μg (p=.025 vs 44 μg, adjusted for multiplicity), 10.3% for 44 μg, and 16.4% for 880 μg (p=NS vs 44 μg). The proportion achieving VH=0 or 0.5+ was 52.6% for 440 μg (p=.008

vs 44 µg), 35% for 44 µg, and 43.1% for 880 µg (p=NS vs 44 µg). At the end of open-label treatment (Month 12), the proportion of subjects achieving VH=0 or 0.5+ was 42.1% overall (43.9% for 440/880 µg, 41.9% for 44/880 µg, 40.5% for 880/880 µg). 32.5%, 29.9%, and 37.9% of subjects were rescued, respectively. The greatest visual benefit at Month 12 was seen in subjects with worse BCVA at baseline. In the 440/880 µg group, those with baseline BCVA <20/100 improved by 9 ETDRS letters, vs 5 letters in those with BCVA <20/40 and 1 letter in those with BCVA ≥20/40. Through Month 12, the most common ocular serious AEs (study eye) were ocular inflammation (2.9%–5.8%), cataract (3.8%), and medication residue (transient drug depot in the visual axis; 2.3%).

CONCLUSION In SAKURA Study 1, significantly more subjects with NIU of the posterior segment receiving the 440-µg dose of intravitreal sirolimus achieved a VH score of 0 or 0.5+ at Month 5 vs an active control dose of 44 µg. Continued benefits on VH as well as visual acuity were observed during the open-label treatment period. The most common ocular serious AEs were related to ocular inflammation.

TAKE HOME MESSAGE In SAKURA Study 1, intravitreal sirolimus yielded reductions in vitreous haze over 12 months in subjects with non-infectious uveitis, with a low incidence of ocular serious adverse events.

HUMAN RESEARCH This study involves human research.
IRB Approval Status: Approved by institutional review board

Ophthalmic Manifestations of Ebola Virus Disease Survivors in Monrovia, Liberia

- Steven Yeh, MD
- Jessica Shantha, MD
- Ian Crozier, MD
- Brent Hayek
- Beau Bruce
- John Fankhauser

OBJECTIVE To describe the ophthalmic findings in a cohort of Ebola survivors evaluated in Monrovia, Liberia.

PURPOSE The current West African Ebola virus disease (EVD) outbreak is the largest in history with over 28,000 cases. Liberia has been subject to 10,666 cases of EVD and 4,806 deaths. Thousands of EVD survivors are at-risk for the "Post Ebola Syndrome", which includes arthralgias, fatigue, and uveitis. Herein, we report the ophthalmic manifestations observed in a Liberian cohort of EVD survivors.

METHODS An eye clinic was established in partnership with the Emory Eye Center and the ELWA Hospital in Liberia to urgently assess eye disease in symptomatic EVD survivors. A retrospective analysis was performed and data collected included demographics (age, gender), medical history including days hospitalized in an Ebola Treatment Unit (ETU) as a surrogate for EVD severity. Ophthalmic symptoms, diagnoses, visual acuities, and exam findings were recorded. Systemic symptoms including joint pain, hair loss, fatigue, and hearing loss were also recorded.

RESULTS Ninety-six EVD survivors were examined. Twenty-seven eyes of 21 patients (21.87%) developed uveitis, which included anterior (2), posterior (13) and panuveitis (6). Ophthalmic symptoms included blurred vision (81%), photophobia (62%), and pain (52%). Systemic symptoms included joint pain (76%), hair loss (38%), fatigue (32%), and hearing loss (10%). Visual acuity was normal (20/20-20/25), mildly impaired (20/30 to 20/60), moderately impaired (20/70-20/160), severely impaired (20/200-20/400), or blind (worse than 20/400) in 33.3%, 22.2%, 7.4%, 3.7%, and 33.3% of eyes

with uveitis. Visual acuity of patients with EVD-associated uveitis was worse than survivors without uveitis ($p<0.0001$). Exam findings associated with at least moderate visual impairment included keratic precipitates ($p<0.01$), posterior synechiae ($p<0.02$) and vitritis ($p<0.01$). The mean number of days in an ETU in patients who developed uveitis (17) was similar to those who did not develop disease (14, $P>0.05$).

CONCLUSION EVD survivors are at risk for uveitis, which may lead to secondary structural complications, visual impairment, and blindness. There is an urgent need to build capacity and mobilize eye care resources for EVD survivors in West Africa.

TAKE HOME MESSAGE Ebola survivors are at-risk for uveitis and vision loss following recovery from their acute illness. Screening and treatment of ocular complications is important in the post Ebola period.

HUMAN RESEARCH This study involves human research.
IRB Approval Status: Approved by institutional review board

Comparison of Microbiology and Visual Outcomes of Patients Undergoing Small-Gauge and 20-Gauge Vitrectomy for Endophthalmitis

- David RP Almeida, MD, MBA, PhD
- Eric K. Chin, MD
- Benjamin Bakall, MD, PhD
- Vinit Mahajan, MD, PhD

OBJECTIVE To compare culture positive rates and visual outcomes between small-gauge (23- and 25-gauge) and 20-gauge instrumentation during vitrectomy for endophthalmitis.

PURPOSE The role of pars plana vitrectomy (PPV) for endophthalmitis has evolved over recent decades but the literature is lacking on comparisons between small-gauge and 20-gauge vitrectomy. We report the evolving etiological and microbiological trends in patients undergoing vitrectomy for endophthalmitis comparing small gauge and 20-gauge vitrectomy.

METHODS Ten-year retrospective comparative case series and prospective laboratory *in vitro* testing at a tertiary care academic referral center. Participants were patients who underwent PPV for endophthalmitis between 2003 and 2013. Vitreous biopsies were obtained in all cases. The effect of vitrectomy gauge (20-, 23-, and 25-gauge) and vitreous cutting rate (1500 and 5000 cuts per minute) on bacterial culture viability was evaluated in an *in vitro* prospective laboratory investigation. Main outcome measures are comparison of etiology, microbiology culture positive rates, and visual outcomes

between small-gauge and 20-gauge instrumentation in patients undergoing PPV for infectious endophthalmitis.

RESULTS A total of 61 cases of vitrectomy for endophthalmitis were identified over a 10-year period; of these, 34 were treated with small-gauge (23- and 25-gauge) vitrectomy and 27 were treated with 20-gauge vitrectomy. In the small-gauge group, 12 cases (35.3%) yielded culture positive results versus 20 cases (74.1%) with culture positivity in the 20-gauge cohort (p=0.002). The most common cause of endophthalmitis was cataract surgery and the most frequently identified organism was coagulase-negative *Staphylococci* in both groups. There was no significant difference in mean postoperative visual acuities between groups (p=0.33). Etiological trends indicate an increase in endophthalmitis due to intravitreal injection in the small-gauge group (n=9) compared to the 20-gauge group (n=3) (p=0.001). *In vitro* laboratory testing revealed no significant difference in rates of culture growth for different vitrectomy gauge sizes or vitreous cutting speeds.

CONCLUSION Small-gauge vitrectomy for endophthalmitis yields final visual outcomes comparable to 20-gauge instrumentation. A significant difference in culture positive rates was observed between small-gauge and 20-gauge instrumentation; however, laboratory testing indicates this is not related to either vitreous gauge size or cutter speed.

TAKE HOME MESSAGE Small-gauge vitrectomy for endophthalmitis yields final visual outcomes comparable to 20-gauge instrumentation; however, significantly less culture postive rates occur with small-gauge vitrectomy.

HUMAN RESEARCH This study involves human research.
IRB Approval Status: Approved by institutional review board