

News in Review

COMMENTARY AND PERSPECTIVE

Neuroretinal Loss: Glaucoma vs. Aging

AFTER EXAMINING SEVERAL neuroretinal parameters typically used to monitor the rate of glaucomatous change, researchers have found that disease is not the only cause of anatomical progression. Age also appears to play a significant role in structural loss.¹

How age figures in. “We found that healthy aging explains a large proportion of the change we see in glaucoma patients,” said Balwantray C. Chauhan, PhD, Mathers Professor, Department of Ophthalmology and Visual Sciences, Dalhousie University, in Halifax, Canada. “Aging is a powerfully important variable that we are now beginning to fully appreciate.”

The study involved 192 treated open-angle glaucoma patients (median age, 68.7 years) and 37 healthy controls (median age, 65.2 years) observed at 6-month intervals for an average of 4 years. All subjects underwent confocal scanning laser tomography (CSLT) to measure the global disc margin–based neuroretinal rim area. Optical coherence tomography (OCT) was used to measure Bruch’s membrane opening (BMO) minimum rim width, BMO

area, and peripapillary retinal nerve fiber layer (RNFL) thickness.

Among the key findings:

- More than 30% of healthy control subjects had a significant reduction of neuroretinal parameters.
- After adjusting for the effects of aging, the difference in rate of change of OCT-based neuroretinal parameters is still worse in treated glaucoma patients compared with controls, but the difference is not statistically significant. “In other words, aging explains most of the significant changes that are observed in well-treated glaucoma patients and controls,” Dr. Chauhan said.
- Minimum rim width and RNFL thickness showed significant loss with normal aging, but disc margin–based neuroretinal area did not, probably because it is a less accurate measurement of the rim, Dr. Chauhan said.

The latter finding underscores the importance of OCT as a clinical tool and reinforces a message previously put forth by Dr. Chauhan and colleagues—that OCT allows clinicians to appreciate optic nerve head and RNFL anatomy in a way not possible before.

The findings weren’t completely unexpected. “We did know that aging would have an effect on the neuroretinal parameters,” Dr. Chauhan said. “However, I was surprised to see how powerful the effect was.”

Putting these results into practice.

The clinical challenge raised by these findings is how to make practical use of them. One strategy would be to remove the effects of aging from clinical calculations, Dr. Chauhan said. But he acknowledged the practical limitations of that approach because there is enormous variation in the effects of aging in the normal population. A further complication to statistical adjustment is that baseline levels of damage can have significant impact on rates of change.

Nevertheless, Dr. Chauhan is seeking to incorporate these findings into practical guidelines for clinicians. “We’re hoping to use this work as a springboard to develop tools for the clinician to segregate out the effects of aging. There could be indices within what we are measuring that could be specific just to glaucoma.” Ultimately, this could lead to more accurate predictions of glaucoma progression.

Meanwhile, he said, “Consider that not all change that you see in your glaucoma patients is due to the disease itself.”

—Miriam Karmel

1 Vianna JR et al. *Ophthalmology*. 2015;122(12):2394-2400.

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Comparison of Antibiotic Routes & Drugs

IF THE GOAL IS TO PREVENT endophthalmitis after phacoemulsification, an intracameral bolus of cefuroxime or moxifloxacin at the end of the surgery provides the most effective method, a large American study has concluded.

The publication of this study¹ capped several years of efforts by Kaiser Permanente–based researchers to confirm what they found in a smaller preliminary study: that the predominant European method of prophylaxis also is appropriate for patients in the United States.² The research also echoed the conclusions of a large Danish study published last year.³

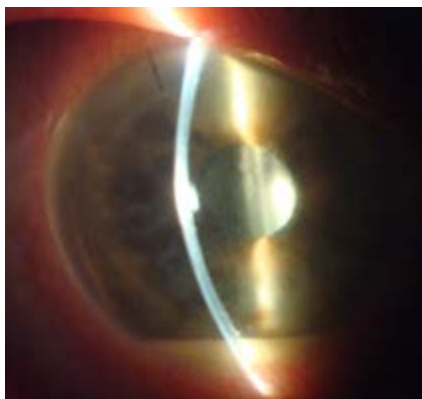
What route; what drug? In the current study, the researchers analyzed the comparative effectiveness of various antibiotic regimens used by Kaiser Permanente ophthalmologists in 315,246 California surgeries over an 8-year period ending in 2012. The analysis showed that, compared with topical antibiotics, the adjusted odds ratio (OR) for incidence of endophthalmitis was 0.53 (95% CI, 0.30-0.95) in the intracameral cefuroxime eyes, and 0.68 (95% CI, 0.36-1.33) for those that received intracameral moxifloxacin.

“Surgeons who can change their approach to include intracameral injection of antibiotic should do so, because it better prevents endophthalmitis than does topical antibiotic,” said Lisa J. Herrinton, PhD, a coauthor of the National Eye Institute–funded study.

Findings on endophthalmitis risk. “We did not find a [significant] difference between intracameral moxifloxacin and intracameral cefuroxime. Either one is better than not using an intracameral agent,” said Dr. Herrinton, who is an epidemiologist at the Kaiser Permanente Division of Research, in Oakland, Calif.

Other key study results included the following:

- Posterior capsular rupture nearly quadrupled the infection risk, com-



POSTOPERATIVE ENDOPTHALMITIS.

A large U.S. study corroborates earlier findings that endophthalmitis, like this case seen 4 days after cataract surgery, can be significantly reduced with intracameral antibiotics.

pared with uneventful phacoemulsification surgery (adjusted OR, 3.68).

- 4.5% of the study eyes received no antibiotic prophylaxis at all, as a result of either prescribing errors or patient noncompliance. The risk of endophthalmitis approximately doubled in

these eyes, compared with eyes that received topical antibiotic therapy (adjusted OR, 1.95).

- The risk of endophthalmitis rose similarly in the 4.2% of eyes that were treated with a topical aminoglycoside, such as neomycin, gentamicin, or tobramycin (OR, 1.97). “Although aminoglycosides are effective against *Staphylococci*, the most common infective organism in post–cataract surgery endophthalmitis, evidence shows that they do not penetrate well into the anterior chamber,” the researchers explained.

- Three commonly used topical antibiotics (the fluoroquinolones gatifloxacin and ofloxacin, and polymyxin/trimethoprim) were equally ineffective at reducing endophthalmitis risk, compared with eyes that received no antibiotic therapy.

What about a combined approach?

Would there be additional benefit from combining intracameral and topical prophylaxis? The study was not powered to answer that question, and

CHILDREN WITH DIABETES

When Should Ocular Screening Begin?

ROUTINE RETINOPATHY SCREENING of all children with type 1 diabetes may not be necessary before the mid-teenage years, according to a pediatric ophthalmology research group at the Children’s Hospital of Philadelphia and the Scheie Eye Institute.¹

Moreover, the researchers suggested that revision of clinical guidelines for the ophthalmic care of these children should be considered in light of these findings. They noted that this might reduce financial and logistic burdens on families and allow better use of pediatric health care resources.

Onset of diabetic retinopathy. In their 2-pronged study, the researchers first performed a retrospective consecutive cohort analysis of the records of all diabetic children who received a complete dilated eye exam at the hospital’s eye clinic during a 4-year period. They also reviewed the published literature about ocular complications of juvenile diabetes. Respectively, the 2 arms of the study showed that:

- None of the 370 children (mean age, 11.2 years; range, 1.0-17.5 years) developed retinopathy; other ocular conditions, such as cataract, presented based upon symptoms and not on retinopathy screening.
- The youngest age reported for a diagnosis of severe diabetic retinopathy was 15, and the shortest duration of diabetes before diagnosis of retinopathy was 5 years.

Controversial—or not? Those findings confirmed the clinical impressions that the pediatric ophthalmologists in the group had before undertaking

most Kaiser Permanente surgeons who use intracameral antibiotics continue to prescribe topical medication after surgery, the researchers wrote.

Although that question remains unanswered, the authors stated: “Subconjunctival and topical antibiotics are intended to kill organisms on the ocular surface; however, aqueous concentrations might not be adequate to kill the most common causative organism, coagulase-negative *Staphylococcus aureus*. In contrast, intracameral antibiotics achieve concentrations that are several times greater than the concentration needed to kill 90% of most bacterial isolates.”

—Linda Roach

1 Herrinton LJ et al. *Ophthalmology*. Published online Oct. 9, 2014.

2 Shorstein NH et al. *J Cataract Refract Surg*. 2013;39(1):8-14.

3 Kessel L et al. *Acta Ophthalmol*. 2015;93(4):303-317.

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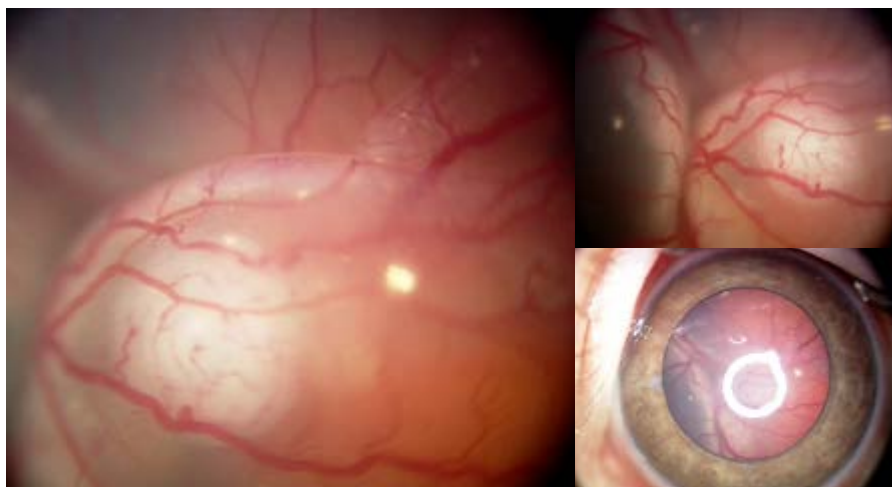
the research, said Gil Binenbaum, MD, MSCE, a coauthor. “Based on their own experiences, I think the majority of ophthalmologists who examine children are likely to agree with us and not find these conclusions controversial,” said Dr. Binenbaum, who is an assistant professor of ophthalmology at the University of Pennsylvania.

Diabetes specialists had a similar response, he said. “When I spoke to some endocrinologists about this, I was anticipating that they would not be comfortable with us not examining children until they’re quite a bit older, but their reaction was generally positive,” Dr. Binenbaum said.

—Linda Roach

1 Geloneck MM et al. *Ophthalmology*. 2015;122(12):2459-2466.

Relevant financial interests—Dr. Binenbaum: Bayer Healthcare Pharmaceuticals: S.



PSYCHOSOCIAL OUTCOMES

Adult RB Survivors Thrive

IN THE LARGEST STUDY OF ITS KIND, researchers at Memorial Sloan Kettering Cancer Center examined a wide array of psychosocial outcomes—from anxiety and depression to satisfaction with facial appearance—in adult survivors of retinoblastoma (RB), now the most curable of all pediatric cancers.¹ “Overall, RB survivors are doing extraordinarily well,” said lead author Jennifer S. Ford, PhD.

Using a questionnaire adapted from the Childhood Cancer Survivor Study (CCSS), the researchers compared the functioning of 470 adult RB survivors—diagnosed from 1932 to 1994—with 2,820 adult participants randomly chosen from the CCSS cohort of siblings who had not had cancer. (None of these siblings were related to the RB survivors studied.)

Overall results. RB survivors had slightly lower rates than CCSS siblings of distress, depression, somatization, and anxiety. Although RB survivors did report posttraumatic symptoms of avoidance or hyperarousal more often, only 5 met criteria for posttraumatic stress disorder (PTSD).

Bilateral survivors. Understandably, bilateral survivors had greater fears than unilateral survivors about cancer recurrence and about their children

being diagnosed with the disease, said Dr. Ford. But even though these bilateral survivors had experienced more extensive disease and had undergone more treatments, they were no more likely than unilateral survivors to report depression, anxiety, or somatic complaints.

In fact, bilateral survivors were significantly less likely to report these symptoms than CCSS siblings, and they even believed in substantially more positive new possibilities in life. “This is not uncommon in survivors of pediatric cancers,” said Dr. Ford. “Through a phenomenon known as response shift, traumatic events can prompt a recalibration of how well things are going in life.”

Getting better. Overall, ophthalmologists can share a very positive message with parents of children with RB. “And with big changes in RB management over the recent past,” said ophthalmologist and coauthor David H. Abramson, MD, “these psychosocial outcomes may only improve in the future.”

—Annie Stuart

1 Ford JS et al. *J Clin Oncol*. Published online Sept. 15, 2015. doi:10.1200/JCO.2014.60.5733.

Relevant financial disclosures—Dr. Abramson: None. Dr. Ford: None.

For the financial disclosure key, see page 8. **For full disclosures**, including category descriptions, view this News in Review at www.eyenet.org.