Journal Highlights

EXTRA CONTENT AVAILABLE

NEW FINDINGS FROM *OPHTHALMOLOGY, AJO,* AND *JAMA OPHTHALMOLOGY*

Ophthalmology

Long-Term Outcomes of Intravitreal Injections for AMD

September *Ophthalmology*

In the largest patient series to date, **Gillies et al.** analyzed the long-term outcomes of patients with neovascular age-related macular degeneration (AMD) who had received intravitreal injections of anti-VEGF agents. They found good long-term outcomes from baseline up to 6 years, with a drop in visual acuity (VA) after that point in eyes that were still being treated.

For this observational study, the researchers analyzed data on 1,212 eyes. Patients' initial visits took place between 2007 and 2010 in Australia, New Zealand, and Switzerland. Mean follow-up time was 53.5 months, with 549 patients (45%) continuing to be treated after 60 months.

Mean VA improved from 55.1 letters to 61.4 letters after 6 months and remained above mean presenting VA for 6 years. However, after 7 years, mean VA had dropped 2.6 letters below baseline for the 131 eyes that were still being followed. The researchers noted that patients tended to discontinue treatment once they had lost the initial gain in VA.

The patients in this study received a slightly higher number of injections compared with those in other studies, the researchers noted. A median of 6 injections and 9 visits was recorded during the first year; this dropped to 5 treatments and 7 to 9 visits per year thereafter. The rate of serious adverse events was low.

Prompt Intervention Improves Outcomes of Repeat DMEK

September *Ophthalmology*

Price et al. evaluated the outcomes of secondary Descemet membrane endothelial keratoplasty (DMEK) after failed primary DMEK procedures. They found that early regrafting produced outcomes comparable to those of successful primary DMEK.

For this retrospective case series, the researchers assessed 55 DMEK recipients. Most had Fuchs endothelial dystrophy, and their median age was 69 years (range, 42-89 years). Secondary DMEK was performed in all 55 eyes; reasons for the 55 regrafts included unsuitable donor tissue, surgical complications, early failure to clear for no identifiable reason, late endothelial failure, and refractive failure. Median follow-up was 18 months (range, 3-61 months). All 55 regrafts cleared successfully, and none experienced immunologic rejection.

A paired analysis was performed in a subset of 29 patients who underwent secondary DMEK in 1 eye and successful primary DMEK in the other. In this group, the median duration of endothelial decompensation before the regraft was 21 days (range, 2-133 days). At 1, 3, 6, and 12 months following surgery, corrected distance visual acuity did not differ between the primary and secondary grafts.

The results of this study suggest that prompt intervention after graft failure can minimize the duration of central corneal decompensation and associated stromal changes, the researchers said. For optimal visual results, the authors recommend regrafting as soon as possible if bullae or microcystic edema is present over the pupil area.

Utility of Cap Color and Bottle Characteristics for Glaucoma Eyedrops

September *Ophthalmology*

How do glaucoma patients identify their medications and distinguish between different bottles? Bottle cap color remains the method of choice, **Marando et al.** found.

For this study, the researchers evaluated 126 patients with glaucoma seen at a single university eye center. Patients ranged in age from 35 to 92 years. Most (90%) had been on glaucoma therapy for more than 1 year, and

50.7% were on monotherapy.

When queried about medication recall, 64.8% of patients referred to bottle cap color, and 48% cited bottle size and shape. Other recall methods mentioned by patients included storage site and bottle color. However, despite its popularity as a recall method, cap color was not a foolproof strategy. Among those who said that they relied on cap color for identifying their drops, 20% did not correctly identify all of the cap colors associated with their prescribed drops.

When asked about potential improvements to glaucoma eyedrop bottles, patients requested that bottles be redesigned to come in larger sizes, be less rigid and easier to manipulate, and be more consistent in dispensing 1 drop at a time.

Photodynamic Therapy for Retinal Tumors

September *Ophthalmology*

Hussain et al. investigated photodynamic therapy (PDT) with verteporfin in treating retinal vasoproliferative tumors. In the largest series to date with long-term follow-up, they reported that PDT successfully treated a majority of tumors with minimal side effects.

For this prospective study, 24 patients (25 eyes) were treated with PDT between 2006 and 2014. Patients received a second treatment 1 to 3 months after the initial dose, if deemed necessary by the investigator. All told, 18 patients needed only 1 session of PDT, 5 needed 2 sessions, and 1 patient needed 3 sessions.

Mean follow-up was 26 months (range, 12-70 months). During this time, 17 eyes (68%) achieved complete tumor regression. In contrast, 4 (16%) experienced no response or progression of their tumors; these lesions all had extensive subretinal fluid.

Visual gain or stabilization occurred in 23 of the 25 eyes (92%), with 15 of the 24 patients improving by 1 to 2 lines. No adverse reactions or complications related to PDT occurred during the follow-up period.

American Journal of Ophthalmology

Primary Sjögren Syndrome in Men

September *AJO*

Mathews et al. reported on the ocular complications of primary Sjögren syndrome (SS) in men, using a retrospective cohort study design. A total of 163 consecutive cases of primary SS were evaluated, and the frequency of extraglandular ocular and systemic manifestations and serologic results in men were compared with those in women.

Of the 163 primary SS patients, 14 (9%) were men. On presentation, men were a decade older (61 vs. 50 years) and less likely than women to have a prior diagnosis of SS (43% vs. 65%). A majority of men reported dry eye on presentation (92%), but it was of a shorter duration compared to women (5.9 vs. 10.8 years). Men, however, were more likely to present with serious ocular complications than women (43% vs. 11%). Extraglandular systemic complications of SS (e.g., vasculitis, interstitial nephritis) were also more common in men (64% vs. 40%). Men were more likely to be negative for anti-SSA/Ro, anti-SSB/La, and antinuclear antibodies than women (36% men vs. 11% women).

The authors concluded that men with primary SS have a higher frequency of serious ocular and systemic manifestations but are likely to be underdiagnosed. Physicians, therefore, should have a lower threshold to test for SS in men with dry eye.

Effect of Cataract Surgery on Wet Macular Degeneration

September *AJO*

Saraf et al. used a retrospective cohort study design to evaluate whether cataract surgery contributes to the progression of wet age-related macular degeneration (AMD) in patients who received at least 1 anti-VEGF injection during a 1-year study period. A control arm included eyes with wet AMD that received anti-VEGF injections but did not undergo cataract surgery during the study period. Best-corrected visual acuity (BCVA), number of anti-VEGF injections, and optical coherence tomography (OCT) features were compared between the 2 arms.

There were 40 eyes in the surgical group and 42 in the control group. BCVA was equivalent between the groups in the first half of the study, but it became significantly better in the surgical group after cataract surgery was performed at the midpoint of the study. No significant change occurred in the number or injections before and after cataract surgery. However, the mean central retinal thickness on OCT was greater in postsurgical eyes compared with control eyes. In addition, surgical eyes were more likely to develop new or worse cystoid changes after the study midpoint (54.2% vs. 28.1%, respectively).

The authors concluded that cataract surgery leads to vision improvement and does not appear to contribute to worsening of wet AMD. However, anatomic changes based on OCT analysis suggest a subclinical susceptibility to cystoid macular edema or exacerbation of choroidal neovascularization.

Iris Fixation vs. Scleral Fixation for Intraocular Lens Dislocation

September *AJO*

Kim et al. compared the efficacy and safety of iris fixation versus scleral fixation in surgical repositioning of dislocated IOLs. This study was a retrospective, consecutive, comparative interventional case series at a single referral hospital in South Korea.

The study evaluated 78 consecutive patients who required surgical IOL repositioning: 44 eyes of 44 patients underwent scleral fixation, and 35 eyes of 34 patients had iris fixation of the dislocated IOL. Corrected distance visual acuity (CDVA) improved significantly 1 week postoperatively in the scleral-fixation group but not in the iris-fixation group. However, at 1 month postoperatively CDVA had improved significantly in both groups and remained stable for 12 months.

The authors concluded that iris-fixation and scleral-fixation techniques had similar efficacy in the repositioning of dislocated IOLs. Iris fixation had the advantage of a shorter operative time; however, it had several disadvantages, including induced astigmatism, immediate postoperative inflammation, and less stable refraction. Although recurrence rates for dislocation were similar between the 2 groups, the mean time to recurrence was significantly shorter in the iris-fixation group.

JAMA Ophthalmology

Effect of Personalized Diabetes Risk Assessments on Glycemic Control

August *JAMA Ophthalmology*

Although optimizing glycemic control is critical to reducing diabetes mellitus–related complications, long-term success is challenging. **Aiello et al.**, from the Diabetic Retinopathy Clinical Research Network, studied whether point-of-care (POC) measurement of hemoglobin A_{1c} (HbA_{1c}) and personalized diabetes risk assessments performed during retinal ophthalmologic visits improved glycemic control.

This office-based randomized, multicenter clinical trial was conducted at 42 sites. Investigators were assigned randomly to provide either a study-prescribed augmented diabetes assessment and education or usual care. Adults with type 1 or 2 diabetes enrolled in 2 cohorts: those with more-frequent-than-annual follow-up (502 control participants; 488 intervention participants) and those with annual follow-up (368 control participants; 388 intervention participants). Interventions included POC measurements of HbA_{1c}, blood pressure, and retinopathy severity; individualized estimate of the risk of retinopathy progression; structured comparison and review of past and current clinical findings; and structured education with immediate assessment and feedback regarding participant's understanding. These interventions were performed at enrollment and at routine ophthalmic follow-up visits scheduled at least 12 weeks apart.

The main outcome measure was mean change in HbA_{1c} level from baseline to 1-year follow-up. Secondary outcomes included body mass index, blood pressure, and responses to diabetes self-management practices and attitudes surveys. In the more-frequent follow-up cohort, the mean (SD) change in HbA_{1c} level at 1 year was −0.1% (1.5%) in the control group and −0.3% (1.4%) in the intervention group. In the annual follow-up cohort, the mean (SD) change in HbA_{1c} level was 0.0% (1.1%) in the control group and −0.1% (1.6%) in the intervention group. Results were similar for all secondary outcomes. The study failed to show that the addition of personalized education and risk assessment during retinal ophthalmologic visits resulted in a reduction in HbA_{1c} level compared with usual care over 1 year. These data suggest that other types of interventions should be studied to help optimize glycemic control.

Glaucoma-Related Adverse Events After Unilateral Cataract Removal

August *JAMA Ophthalmology*

Glaucoma-related adverse events constitute major sight-threatening complications of cataract removal in infancy. **Freedman et al.**, for the Infant Aphakia Treatment Study Group, identified and characterized cases of glaucoma and glaucoma-related adverse events by the age of 5 years among children in the Infant Aphakia Treatment Study (IATS).

In this secondary analysis of a multicenter randomized clinical trial of 114 infants with unilateral congenital cataract who were between ages 1 and 6 months at surgery, mean follow-up was 4.8 years. Participants were randomized at cataract surgery to either primary IOL implantation or aphakia (i.e., contact lens correction). The IATS used standardized definitions of glaucoma and glaucoma-related adverse events (the study called the latter "glaucoma + glaucoma suspect") for diagnosis and surveillance. The main outcomes included development of glaucoma and glaucoma + glaucoma suspect in operated eyes of children up to age 5 years, plus IOP, visual acuity, and axial length at age 5 years.

The estimates of the risk for glaucoma and glaucoma + glaucoma suspect at 4.8 years after surgery were 17% and 31%, respectively. No significant difference was identified between the IOL and aphakia groups for either outcome. However, younger (vs. older) age at surgery increased the risk for glaucoma (26% vs. 9%, respectively) at 4.8 years after surgery (HR, 3.2; 95% CI, 1.2-8.3); and smaller (vs. larger) corneal diameter increased the risk for glaucoma + glaucoma suspect (HR, 2.5; 95% CI, 1.3-5.0).

By 5-year follow-up, 20 eyes had developed glaucoma; of these, 19 (95%) had open-angle glaucoma. Most eyes received medication (19 of 20; 95%), and 8 of 20 eyes (40%) underwent surgery. The results suggest that glaucoma-related adverse events are common and increase between ages 1 and 5 years in children who had unilateral cataract removal at 1 to 6 months of age. Longer follow-up may further characterize glaucoma risk factors, long-term outcomes, potential differences between primary IOL and aphakia, and optimal timing of unilateral congenital cataract removal.

Development and Validation of a Smartphone Visual Acuity Test

August *JAMA Ophthalmology*

Most visually impaired people live in low- and middle-income countries. To aid in monitoring vision worldwide, **Bastawrous et al.** designed and sought to validate a smartphone-based visual acuity test that is not dependent on familiarity with symbols or letters commonly used in the English language.

This validation study, conducted from Dec. 11, 2013, to March 4, 2014, compared results from smartphone-based Peek Acuity to Snellen acuity charts and the Early Treatment of Diabetic Retinopathy Study (ETDRS) logMAR chart (reference standard). This

study was nested within the 6-year follow-up of the Nakuru Eye Disease Cohort in central Kenya and included 300 consecutively recruited adults aged 55 years or older.

The main outcome measures were monocular logMAR VA scores for each test: ETDRS, Snellen, and Peek Acuity. Comparisons were also made of test-retest variability and measurement time in participants' homes and temporary clinic settings in rural Kenya. The local Kenyan community health care workers readily accepted the Peek Acuity smartphone test; it required minimal training and took no longer to perform than the Snellen test.

The 95% CI limits for test-retest variability of smartphone acuity data were ±0.033 logMAR. The mean differences between the smartphone test and the ETDRS chart, and between the smartphone test and Snellen acuity data were 0.07 (95% CI, 0.05-0.09) and 0.08 (95% CI, 0.06-0.10) logMAR, respectively, indicating that smartphone-based test acuities agreed well with those of the ETDRS and Snellen charts. These results demonstrate that the Peek Acuity smartphone test is capable of accurate and repeatable acuity measurements consistent with published data on the test-retest variability of acuities measured using 5-letter-per-line retroilluminated logMAR charts.

ROUNDUP OF OTHER JOURNALS

Optic Neuropathy Linked to Antidepressants

Eye
Published online July 3, 2015

In a reminder that systemic medications can have serious ophthalmic consequences, **Lochhead** reported 5 cases of optic neuropathy (ON) in patients who had taken selective serotonin reuptake inhibitors (SSRIs). This group of medications is commonly prescribed for depression and includes the drugs Paxil, Prozac, and Zoloft.

The cases were identified in the Isle of Wight population during a 2-year period by means of a retrospective analysis of case notes. Each case was assessed using the Naranjo algorithm to indicate the likelihood of an adverse drug reaction.

The 5 affected patients were relatively young (in their 40s and 50s), and their duration of SSRI use ranged from 6 months to 14 years. Of the 5 patients, 4 presented with posterior ischemic ON, and the fifth presented with bilateral anterior ischemic ON. Only 1 of the 5 achieved full visual recovery, while 1 achieved partial recovery, and the remaining 3 experienced no recovery. Smoking and diabetes were identified as potentially synergistic risk factors in 4 of the 5 cases. Until more is understood about the mechanisms of this potentially blinding side effect, the authors advised caution in prescribing SSRIs to patients with known ocular vascular disease or systemic vascular risk factors.

Refractive Outcomes With Triple DMEK

Journal of Cataract and Refractive Surgery
2015;41(6):1182-1189

Schoenberg et al. reported on the refractive outcomes of triple Descemet membrane endothelial keratoplasty (DMEK)—that is, DMEK combined with phacoemulsification and IOL implantation. They found that the procedure consistently achieved excellent corrected distance visual acuity (DVA).

For this retrospective case series, the researchers reviewed the records of 108 sequential triple DMEK procedures performed by 2 surgeons at a single center. In all study patients, Fuchs endothelial dystrophy was the indication for DMEK. Eyes with prior refractive surgery, concurrent keratoconus, amblyopia, or preexisting macular pathology were excluded.

With a mean follow-up of 11.9 months, the median corrected DVA was 20/20 (range, 20/15-20/40), and the median uncorrected DVA was 20/40 (range, 20/20-20/200). All told, 45% of patients gained 3 or more lines of corrected DVA. Because DMEK is known to produce a hyperopic shift, the researchers recommend selecting an IOL power to target a postoperative refraction of –0.75 D to –1.0 D to achieve the best range of functional vision. The researchers noted that aspheric IOLs (n = 91) did not significantly change refractive astigmatism, but that toric IOLs (n = 9) did.

Photovoltaic Restoration of Sight

Nature Medicine
2015;21(5):476-482

Lorach et al. described their research on a new type of retinal prosthetic device in a study of rats with retinal degeneration. They reported encouraging results with regard to ease of implantation and visual acuity results.

Unlike the 2 types of retinal prostheses now used in humans, the photovoltaic implants in this study are completely wireless. They contain subretinal pixels that convert pulsed light, both in the visible and near-infrared spectrum, into electric current. The implants were evaluated in retinal ganglion cells (RGCs) in vitro (to examine the spatial resolution of the retinal response) and in vivo (to assess visual acuity).

The researchers demonstrated that the implants 1) provided highly localized stimulation of retinal neurons and 2) elicited retinal responses with a spatial resolution corresponding to half of the normal visual acuity in healthy rats. At the highest settings used in the study, electrical stimulation of RGCs for many hours at a time in vitro and in vivo did not decrease responsiveness or produce any signs of tissue damage.

Ophthalmology *summaries are written by Jean Shaw and edited by Susan M. MacDonald, MD.* American Journal of Ophthalmology *summaries are edited by Thomas J. Liesegang, MD.* JAMA Ophthalmology *summaries are based on authors' abstracts as edited by senior editor(s).* Roundup of Other Journals *is written by Jean Shaw and edited by Deepak P. Edward, MD.*

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