

# Journal Highlights



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

### *Ophthalmology*

#### Assessing the Safety of Outpatient Cataract Surgery

February *Ophthalmology*

How safe is outpatient cataract surgery, especially if anesthesiology staff are not immediately at hand? Koolwijk et al. evaluated their non-anesthesia-supported cataract service and found that the surgery can indeed be safely performed in such a setting.

For this retrospective observational study, the researchers evaluated patients who were slated to undergo elective phacoemulsification under topical anesthesia in their outpatient unit over a two-year period. This particular unit is situated within—but operates largely independent of—its parent hospital, which is a tertiary care facility in the Netherlands. The hospital's medical emergency team (MET) was available as needed.

All told, 6,961 cases (4,347 patients) were eligible for analysis. The primary outcome measure was the incidence of adverse events requiring MET interventions. Secondary outcomes included surgical ocular complication rates and the rate of patient transfers to the hospital's classic operating room.

Three patients needed attention from the hospital's MET unit, for an intervention rate of 0.04 percent, and were diagnosed as having vasovagal

collapse. Two occurred during the postop period, and the third occurred during the first checkup. All three patients recuperated uneventfully, without needing to be hospitalized. Surgical complications such as posterior capsule rupture and iris trauma occurred in 71 patients.

A total of 38 patients underwent surgery in the hospital's operating room, and all but one from this group received general anesthesia. Reasons for the transfer to this setting included cognitive impairment and/or psychological factors such as claustrophobia and significant anxiety, as well as the patient's expressed wish.

#### Preferred Testing Methods for Hydroxychloroquine Toxicity

February *Ophthalmology*

Because detecting hydroxychloroquine retinal toxicity presents several practical challenges for ophthalmologists, Cukras et al. set out to compare subjective and objective testing methods.

The investigators found that spectral-domain optical coherence tomography (SD-OCT) and automated visual field testing are objective measures that demonstrate clinically useful sensitivity and specificity. In addition, they report that these two tests may be

used as reasonable surrogates for the gold standard, multifocal electroretinography (mfERG), which is not widely available at this time.

For this prospective, single-center case-control study, the researchers assessed 57 patients who had been treated with hydroxychloroquine for at least five years. The patients were evaluated with color fundus photography, fundus autofluorescence

imaging, SD-OCT, Humphrey 10-2 visual field testing, and mfERG. The mfERG parameters were used to classify the presence ( $n = 19$ ) or absence ( $n = 38$ ) of hydroxychloroquine retinal toxicity.

Using a polynomial modeling approach, the researchers found that visual field mean deviation and OCT retinal thickness measurements were the variables most strongly associated with the presence of hydroxychloroquine toxicity as identified by mfERG testing.

Based on these findings, they concluded that these two tests can be used in combination as a screening tool to identify patients with possible hydroxychloroquine toxicity. The ophthalmologist can then consider results of additional testing and the consistency of the evidence in deciding whether or not to recommend discontinuation of the drug.



**Link Between Diabetes and Glaucoma**January *Ophthalmology*

Zhao et al. investigated the suggested link between diabetes and the risk of primary open-angle glaucoma (POAG). They found that the presence and duration of diabetes were associated with an increased risk of glaucoma, ocular hypertension (OHT), and increased intraocular pressure (IOP). They also found a weak association between fasting glucose levels and higher IOP.

For this systematic review and meta-analysis, the authors identified 47 studies that involved nearly 3 million individuals from 16 countries. Of the studies, 16 were conducted in North America, 15 in Asia, 11 in Europe, two in Australia, and one each in Africa, the Middle East, and the West Indies. The majority of the studies ( $n = 32$ ) were cross sectional, although six were longitudinal. Five had dose-response data on diabetes duration.

Across all studies, the prevalence of glaucoma ranged from 1.5 to 8.1 percent, and the prevalence of OHT ranged from 1.1 to 10.9 percent. The pooled relative risk for glaucoma was 1.48 in patients with diabetes versus those without diabetes. Moreover, the risk of glaucoma increased by 5 percent for each year after the initial diagnosis of diabetes. The pooled average difference in IOP between patients with and without diabetes was 0.18 mmHg, whereas the pooled average increase in IOP associated with an increase of 10 mg/dL in fasting glucose was 0.09 mmHg.

**American Journal of Ophthalmology****Treat-and-Extend Regimen for AMD**January *AJO*

Rayess et al. evaluated a treat-and-extend regimen in patients with neovascular age-related macular degeneration (AMD) and found it to be an adequate treatment protocol for up to three years, as patients achieved and maintained significant visual and anatomic improvements.

For this consecutive case series, the researchers treated 212 eyes of 196 AMD patients with either intravitreal ranibizumab or bevacizumab for a minimum of one year using a treat-and-extend regimen. The mean follow-up period was 1.88 years. Patients received, on average, 7.6, 5.7, and 5.8 injections over years 1, 2, and 3 of treatment, respectively.

At baseline, mean best-corrected visual acuity (BCVA) was 20/139; it improved to 20/79 after one year of treatment and was maintained at 20/69 and 20/64 at two and three years, respectively. Mean central retinal thickness was 351  $\mu\text{m}$  at baseline and significantly decreased to 285  $\mu\text{m}$ , 275  $\mu\text{m}$ , and 276  $\mu\text{m}$  at one, two, and three years, respectively. At final follow-up, 94 percent of eyes had lost fewer than three lines of BCVA, and 34 percent of eyes had gained at least three lines.

**Vitreomacular Adhesion Treated With Ocriplasmin**January *AJO*

Warrow et al. evaluated treatment outcomes of intravitreal ocriplasmin in symptomatic vitreomacular adhesion (VMA). They found the VMA release rate was comparable to those reported by prior studies, despite inclusion of patients with macular comorbidities. In addition, spectral-domain optical coherence tomography (SD-OCT) identified a significant number of subjects with transient outer retinal attenuation.

For this retrospective interventional case series, the researchers included 35 patients (35 eyes) with symptomatic VMA who received intravitreal ocriplasmin injection.

Eleven patients (31 percent) had macular comorbidities. Average adhesion diameter was 571  $\mu\text{m}$ , with a mean duration of symptoms of 7.9 months. Nine patients (26 percent) had epiretinal membrane, and six (17 percent) had macular hole (mean diameter, 186  $\mu\text{m}$ )—one of which later closed. Mean preinjection logMAR visual acuity was 0.46 and improved to 0.33 at final follow-up. Fifteen eyes

(43 percent) achieved adhesion release at a mean of 10 days after injection. Transient outer retinal attenuation occurred in 10 of 35 patients (29 percent), with eight of 10 (80 percent) achieving adhesion release. One patient (3 percent) developed a retinal detachment.

The researchers noted that VMA was more likely to resolve in younger patients without comorbidities and with small adhesion diameter, short adhesion duration, and transient outer retinal attenuation. They therefore recommend careful patient selection and postinjection SD-OCT monitoring.

**Intravitreal Bevacizumab Every Two Weeks for Treatment of AMD**January *AJO*

Barikian et al. evaluated the benefit of rapid induction with intravitreal bevacizumab for treatment of neovascular age-related macular degeneration (AMD). They found that biweekly induction did not increase the initial fluid-free interval or yield significant anatomic and functional benefits compared with monthly induction or an immediate pro re nata (PRN) regimen. Moreover, biweekly induction may be associated with development of subretinal fibrosis.

In this pilot study, patients with AMD were randomized 1:1:1 into one of three groups based on the initiation sequence: every two weeks for three consecutive injections, every four weeks for three consecutive injections, and immediate PRN after the first injection. Eyes with retinal angiomatous proliferation and polypoidal choroidal vasculopathy were excluded. Best-corrected visual acuity (BCVA) and central retinal thickness using optical coherence tomography (OCT) were measured at baseline and at each follow-up. After induction, bevacizumab was administered PRN based mainly on OCT findings. The main outcome measure was the mean initial fluid-free interval after induction. Secondary outcomes were mean improvement in BCVA and central retinal thickness.

Each group included 30 patients (30

eyes). The mean initial fluid-free interval was 2.4, 3.4, and 3.5 months for biweekly induction, monthly induction, and immediate PRN groups, respectively. These differences were not statistically significant when corrected for age and sex. Mean improvements in BCVA, central retinal thickness, and total number of injections were similar among the groups at 12 months. Six eyes in the biweekly induction group developed subretinal fibrosis compared with none of the eyes in the other two groups.

### Progression Rates and Factors in Preperimetric Open-Angle Glaucoma

January *AJO*

In this longitudinal, observational study, Kim et al. investigated the rate of progressive visual field (VF) loss and associated factors for progression in preperimetric open-angle glaucoma (OAG). They found that after at least five years of follow-up, a majority of medically treated, preperimetric OAG patients had structural or functional progression. In addition, optic disc hemorrhage and inadequate intraocular pressure (IOP) control were significantly associated with structural or functional deterioration.

The researchers included 127 eyes of 127 preperimetric OAG patients who were treated with topical medication and followed for more than five years. Progression was defined as a structural (glaucomatous change confirmed by stereo optic disc photography) or functional (new glaucomatous defect on standard automated perimetry) deterioration.

Glaucoma progression was detected in 72 of 127 eyes (57 percent). Mean rate of VF progression was  $-0.39 \pm 0.64$  dB per year in all patients,  $-0.66 \pm 0.60$  dB per year in progressors, and  $-0.03 \pm 0.24$  dB per year in nonprogressors. A multivariate Cox proportional hazard model revealed that optic disc hemorrhage and the percentage reduction in IOP were significantly associated with disease progression. Moreover, patients with disc hemorrhage had a greater cumulative prob-

ability of progression than those without disc hemorrhage.

### JAMA Ophthalmology

#### Aspheric Toric vs. Aspheric Control IOLs in Patients With Cataract and Corneal Astigmatism

December *JAMA Ophthalmology*

With spectacle independence becoming increasingly important in cataract surgery, Visser et al. compared implantation of bilateral aspheric toric intraocular lenses (IOLs) and bilateral aspheric control IOLs in patients with cataract and corneal astigmatism. The researchers found that bilateral toric IOLs resulted in greater spectacle independence for distance vision.

This clinical trial included 86 individuals with bilateral cataract and corneal astigmatism of at least 1.25 D who were randomized to undergo either bilateral toric ( $n = 41$ ) or bilateral control ( $n = 45$ ) IOL implantation. Main outcomes and measures were spectacle independence for distance vision, uncorrected distance visual acuity, refractive astigmatism, contrast sensitivity, wavefront aberrations, and quality of life. Preoperatively, mean corneal astigmatism was 2.02 and 2.00 D in the toric and control groups, respectively. Four patients in the toric group were lost to follow-up.

At six months postoperatively, 26 patients (70 percent) in the toric group achieved an uncorrected distance visual acuity of 20/25 or better compared with 14 (31 percent) in the control group. Spectacle independence for distance vision was achieved by 31 patients (84 percent) in the toric group compared with 14 patients (31 percent) in the control group. Mean refractive astigmatism was  $-0.77$  and  $-1.89$  D in the toric and control groups, respectively. The mean magnitude of error for the toric IOLs was  $+0.38$  D, indicative of overcorrection.

No significant differences were found in contrast sensitivity, higher-order aberrations, or refractive error-related quality of life.

#### Effect of Laser Iridotomy on Pigment Dispersion Syndrome

December *JAMA Ophthalmology*

Gandolfi et al. evaluated the role of drug-induced mydriasis and laser peripheral iridotomy (LPI) in patients with pigment dispersion syndrome (PDS) who are at risk for ocular hypertension. They found that phenylephrine testing helped to identify those eyes at high risk for developing intraocular pressure (IOP) elevation, while LPI reduced the rate of elevation.

In this 10-year clinical trial, 72 patients with PDS underwent phenylephrine testing. Of these, 29 patients (58 eyes) tested positive for subsequent IOP elevation, and 43 patients (59 eyes) tested negative. For the 21 high-risk patients who qualified for follow-up, one eye was randomly assigned to LPI and the fellow eye was left untreated. For the 35 low-risk patients who qualified for follow-up, the affected eyes were left untreated. The researchers defined an event as an IOP elevation of 5 mmHg or more from baseline.

In the high-risk group, three of 21 eyes that underwent LPI (14.3 percent) and 13 of 21 untreated eyes (61.9 percent) showed an increase in IOP of 5 mmHg or higher. Four of 35 low-risk eyes (11.4 percent) showed a similar increase. Mean event-free time was 7.99 years for high-risk treated eyes, 3.89 years for high-risk untreated eyes, and 7.16 years for low-risk eyes. The log-rank test revealed the following:  $p < .001$  for treated high-risk eyes versus untreated high-risk eyes,  $p = .74$  for treated high-risk eyes versus low-risk eyes, and  $p < .001$  for untreated high-risk eyes versus low-risk eyes.

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