

# Journal Highlights

## NEW FINDINGS FROM *OPHTHALMOLOGY*, *AJO* AND *ARCHIVES*

### ***Ophthalmology***

#### **Adherence in Patients Taking Glaucoma Drops**

May's *Ophthalmology*

**R**ees et al. compared patients who adhere to ocular hypertensive treatment with those who do not adhere. They found that nonadherers tend to be significantly younger; less likely to have other health conditions or to use medicines other than their eyedrops; and less likely to believe that eyedrops for glaucoma are necessary.

These findings are the result of a cross-sectional study designed to determine the rate of intentional and unintentional nonadherence in glaucoma patients and to identify associations between adherence and patients' beliefs. Of the 131 glaucoma patients surveyed, 59 (45 percent) reported some degree of nonadherence. Of these individuals, 39 (66.1 percent) reported unintentional nonadherence such as forgetting, 10 (16.9 percent) reported deliberate nonadherence, and 10 (16.9 percent) said they both deliberately and nondeliberately did not use the eyedrops. The degree of intentional nonadherence was associated with the patient's level of concern about the

ability of eyedrops to control glaucoma and limit its effects.

The authors conclude that reasons for both intentional and unintentional nonadherence should be addressed when seeking solutions.

#### **Prevalence of AMD in Asian Populations**

May's *Ophthalmology*

**K**awasaki et al. reviewed the prevalence of age-related macular degeneration in Asian populations and compared these data with prevalence in Caucasian populations.

In individuals 40 to 79 years of age, age-specific prevalence of late AMD was comparable between Asians (0.56 percent) and Caucasians (0.59 percent). However, early AMD rates were lower in Asians (6.8 percent) than Caucasians (8.8 percent) in this age range. In addition, the researchers found substantially higher rates of late AMD prevalence in Asian men as compared with Asian women or Caucasian men in this age range.

They speculated that the higher rates of late AMD in Asian men could reflect the higher proportion of polypoidal choroidal vasculopathy lesions among Asian men, which, according to the authors, is recognized in Asian hospital-based studies as being more frequent among patients with

exudative AMD signs.

Given that an estimated 25 percent of the Asian population will be 60 years of age or older by 2050, the authors call for additional studies to obtain more precise estimates for AMD prevalence in this population.

#### **Identifying Child Abuse Through Ocular Conditions**

May's *Ophthalmology*

**B**hardwaj et al. reviewed 20 articles in the literature to determine the diagnostic accuracy of intraocular hemorrhages, perimacular retinal folds, traumatic retinoschisis and optic-nerve sheath hemorrhages in identifying abusive head trauma (AHT) in infants without a credible history of accident or a medical condition.

The authors found that the overall sensitivity of intraocular hemorrhages for AHT was 75 percent with a specificity of 94 percent. Optic nerve sheath hemorrhages had a sensitivity for AHT of 72 percent and a specificity of 71 percent. Traumatic retinoschisis was reported in 8 percent of AHT, and perimacular retinal folds were reported in 14 percent of AHT, but neither was reported in other conditions—thus demonstrating a high specificity to AHT.

The authors note that accurately classifying this type of trauma as abuse is difficult since the trauma is generally denied by the perpetrators and



not witnessed by others. However, the diagnostic accuracy for abuse may be improved when the patient presents with multiple pathologies such as intraocular hemorrhages, optic nerve sheath hemorrhage and intracranial hemorrhage.

### *American Journal of Ophthalmology*

#### **Topical Mecamylamine for Diabetic Macular Edema**

May's *AJO*

Since stimulation of nicotinic acetylcholine (nACh) receptors on vascular endothelial cells promotes angiogenesis and vascular permeability in animal models, **Campochiaro et al.** investigated the safety and bioactivity of topical mecamylamine—an antagonist of nACh receptors—in patients with diabetic macular edema.

In this multicenter trial, 23 patients with chronic diabetic macular edema received mecamylamine 1 percent twice daily for 12 weeks. Patients underwent safety assessments, BCVA measurement, and measurement of foveal thickness at baseline and at one, four, eight, 12 and 16 weeks. The mecamylamine drops were well tolerated with no drug-related safety problems. Mean improvement in BCVA at one, four, eight, 12 and 16 weeks was 2.8, 1.9, 2.4, 0.8 and 3.1 letters, respectively. There was little change in mean excess foveal thickness.

There was substantial heterogeneity in response: Eight patients showed convincing improvement in BCVA, foveal thickness or both; nine patients showed equivocal or no substantial changes; and four patients showed worsening. Five patients showed a substantial improvement in BCVA, foveal thickness or both between their last visit while receiving mecamylamine and one month after stopping mecamylamine.

This study suggests that administration of topical mecamylamine may have heterogeneous effects in patients with diabetic macular edema. Variable expression of nACh receptor subtypes on endothelial cells that have different

effects on permeability might explain these results. More specific nACh receptor blockers may dissociate antipermeability and propermeability effects.

#### **OCT Evaluation and Clear Corneal Incisions**

May's *AJO*

**Chee et al.** compared wound characteristics and integrity of the 2.2-mm and 2.65-mm clear corneal incisions in a prospective, randomized clinical trial.

Patients undergoing phacoemulsification with lens implant were randomized to receive a 2.2-mm or 2.65-mm temporal clear corneal incision. The incisions were evaluated at two, 24 and 96 hours for gape and wound architecture using anterior segment optical coherence tomography and for integrity using the Seidel test. Squareness of an incision (ratio of the incision length to the width) was also calculated.

There were 30 patients in each group. Both incision sizes were watertight, although a mild internal main wound gape was detected on anterior segment OCT in 35 eyes (58 percent) at two hours after surgery. At 96 hours, the gape in eight eyes (23 percent) had closed. The mean squareness of incisions in eyes without a wound gape at two hours was lower than in those eyes with a wound gape. A squareness factor of 0.72 or more had a positive predictive value of 79 percent for presence of wound gape at two hours and a negative predictive value of 61 percent.

At all time points, none of the main wounds had a leak. One side-port incision with a squareness factor of 1.39 had a mild leak at two and 24 hours, but was sealed by 96 hours. No gape for that incision was seen on anterior segment OCT of both the main wound and side-port incisions at two hours and 24 hours.

The authors conclude that both the 2.2-mm and 2.65-mm clear corneal incisions were clinically competent, but the side-port incision may leak. A truly square wound had a greater likelihood of being associated with internal wound gape at two hours after surgery,

especially if the squareness factor is 0.72 or more.

#### **Fluocinolone Acetonide Intravitreal Insertion and Glaucoma Drainage Devices**

May's *AJO*

For eyes with uveitis and elevated IOP receiving maximum-tolerated IOP-lowering therapy, **Malone et al.** investigated whether a fluocinolone acetonide sustained-release intravitreal drug delivery system could be implanted safely at the same time that a glaucoma drainage device is placed.

This retrospective, observational case series included subjects with chronic noninfectious intermediate uveitis or posterior uveitis and elevated IOP who were receiving maximally tolerated medical therapy. Fluocinolone acetonide implantation and glaucoma tube-shunt placement were performed in a single surgical session. The main outcome measures were inflammatory recurrences, visual acuity, use of adjunctive anti-inflammatory therapy, IOP and adverse events.

Seven eyes of five patients were studied. The average number of inflammatory recurrences in the 12 months before implantation was three episodes per eye.

Of the three eyes followed up for more than 30 months, none had an inflammatory recurrence 30 months after implantation. The mean Snellen visual acuity in the 12 months after the combined surgery was 20/114, compared with 20/400 at baseline. Adjunctive steroid use decreased. Average IOP decreased from 27.3 mmHg at baseline to 14.6 mmHg 12 months after the combined surgery.

### *Archives of Ophthalmology*

#### **Delaying Treatment of Ocular Hypertension**

March's *Archives*

**Kass et al.** compared the safety and efficacy of earlier vs. later treatment in preventing primary open-angle glaucoma (POAG) in individuals

with ocular hypertension.

The authors randomized 1,636 individuals with IOPs between 24 and 32 mmHg in one eye and 21 and 32 mmHg in the fellow eye to either observation or medication. The observation group was followed for a median of 7.5 years and then received medication for a median of 5.5 years. The other group received medication for a median of 13 years.

At 13 years, the cumulative proportion of participants in the observation group who developed POAG was 0.22 vs. 0.16 in the medication group. Among participants at the highest third of baseline risk for developing POAG, the cumulative proportion developing POAG was 0.40 in the original observation group and 0.28 in the original medication group. There was little evidence of increased adverse events associated with medication.

The authors conclude that early treatment decreases the cumulative incidence of POAG. The absolute reduction was greatest in individuals at high risk for developing POAG, and therefore these are the patients most likely to benefit from early preventive treatment.

### Hepatic Abnormalities and Uveal Melanoma

March's Archives

**F**einstein et al. reviewed initial CT scan reports generated within one month of uveal melanoma diagnosis to document the prevalence and type of hepatic abnormalities detected.

CT reports of 91 patients were reviewed and classified into one of the following four groups: normal appearing liver, hepatic abnormality detected (but not attributable to metastatic melanoma), questionable metastasis (unable to classify) and suspicious for metastatic disease.

The authors reviewed follow-up biopsy, imaging and physician records of the patients whose CT scan reports were classified as either suspicious for metastatic disease or questionable for metastasis.

Fifty (55 percent) of the 91 patients

had one or more hepatic abnormalities identified on CT scan. Abnormalities included 38 focal and 15 diffuse lesions. Three (3.3 percent) of the 91 patients had confirmed hepatic metastasis. For those reports classified as suspicious for metastasis, lesions were significantly more likely to be multiple than solitary.

### Dexamethasone Drug Delivery System and DME

March's Archives

**H**aller et al. evaluated the safety and efficacy of a dexamethasone posterior-segment drug delivery system (Ozurdex) in eyes with diabetic macular edema.

The authors randomized eyes with persistent macular edema (duration of 90 days or more) following laser or other treatment to one of three groups: one receiving a single intravitreal dose of 700- $\mu$ g dexamethasone, one receiving a single intravitreal dose of 350- $\mu$ g dexamethasone and a control observation group.

The primary outcome measure was the proportion of eyes that achieved an improvement in BCVA of 10 letters or more from baseline at day 90. Other outcome measures included fluorescein leakage, central retinal thickness and safety parameters.

At day 90, a BCVA improvement of 10 letters or more was seen in 33.3 percent of eyes in the 700- $\mu$ g group, 21.1 percent in the 350- $\mu$ g group and 12.3 in the observation group. At day 180, a BCVA improvement of 10 letters or more was seen in 30 percent of eyes in the 700- $\mu$ g group, 19 percent in the 350- $\mu$ g group and 23 percent in the observation group. There were also significantly greater improvements in central retinal thickness and fluorescein leakage in treated eyes than observed eyes.

Ophthalmology summaries are written by Lori Baker Schena and edited by John Kerrison, MD. American Journal of Ophthalmology summaries are edited by Thomas J. Liesegang, MD. Archives of Ophthalmology summaries are written by the lead authors.

## Coming in the next EyeNet

### Feature

#### The Miracles of Imaging

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### Clinical Update

#### Comprehensive

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#### Glaucoma

Increased risk for glaucoma in Hispanic and African-American patients.

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Sports-related eye and head injuries.

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## ROUNDUP OF OTHER JOURNALS

### Outcomes in Penetrating Keratoplasties

*Cornea*  
2010;29:254–259

**Yildiz et al.** conducted a retrospective chart review to help clarify whether another penetrating keratoplasty should be recommended in patients with multiple failed grafts.

The study involved 45 patients who had undergone three or more penetrating keratoplasties. The breakdown of their 152 grafts included 45 third penetrating keratoplasties, 11 fourth, three fifth, two sixth and one seventh. The initial penetrating keratoplasties were most commonly performed to treat pseudophakic bullous keratoplasty (41 percent of patients). Other conditions included Fuchs dystrophy (16 percent) and stromal dystrophies (11 percent).

The researchers found that 53 percent of third grafts and 27 percent of fourth grafts survived at the last follow-up visit, with a median follow-up of 4.3 years for the third grafts and 8.4 years for the fourth grafts. One-, two- and five-year graft survival rates were 89 percent, 78 percent and 53 percent for the third grafts and 73 percent, 73 percent and 64 percent for the fourth grafts, respectively. The median survival time for the third graft was 12.8 years in Fuchs dystrophy, 5.2 years in herpetic keratitis, 2.3 years in iridocorneal endothelial syndrome and two years in stromal dystrophies. Risk-factor analysis on the third grafts

showed that previous glaucoma procedures and corneal neovascularization are statistically significant risk factors for graft failure.

The authors suggest that regrafts may represent a viable option if better postoperative management improved the prognosis of third or fourth re-grafts compared with previous grafts, and if the most recent graft remained clear for many years.

### Axial Length and IOP Variation

*Investigative Ophthalmology & Visual Science*  
2010;51:933–937

**Loewen et al.** found that shorter eyes had a larger 24-hour variation in IOP than longer eyes. The researchers collected 24-hour data from nine healthy young adults with hyperopia (ages 18 to 25) in a sleep laboratory. Every two hours, IOP measurements were taken for five minutes in the supine position and for five minutes in the sitting position. This was done throughout a 16-hour diurnal/wake period as well as supine during an eight-hour nocturnal/sleep period. These findings were then compared with previously collected data involving 32 individuals with emmetropia or mild myopia and 34 individuals with moderate to severe myopia.

The researchers found that 24-hour IOP fluctuation was negatively correlated with axial length. Hyperopic eyes with a shorter axial length experienced a larger 24-hour IOP variation—with the higher IOP occurring in the early morning before awakening and the lowest in the late evening. They also found that in all three groups, the nocturnal supine IOP was higher than the diurnal sitting IOP.

They conclude that basal 24-hour IOP change is correlated with axial length, and this correlation pertains to the entire spectrum of healthy young adults—including those hyperopics with a shorter axial length.

### Corneal Tissue in Deep Anterior Lamellar Keratoplasty

*Investigative Ophthalmology & Visual Science*  
2010;51:775–781

**Chen et al.** point out that until recently, most surgeons who performed deep anterior lamellar keratoplasty (DALK) chose to use fresh corneal tissue due to the perception that fresh tissue is necessary for a successful corneal transplant. However, the cellular components of fresh corneal tissue may be responsible for DALK rejection. An alternative is to use glycerin-cryopreserved corneal tissue (GCCT). In this retrospective study of the medical records of 48 patients who underwent DALK, the researchers found that the clinical results achieved with GCCT were comparable to those achieved with fresh corneal tissue.

No graft rejection developed in the GCCT group of 26 patients. However, in the fresh corneal tissue group of 22 patients, one eye developed stromal rejection. There were also no significant differences between the two groups at 24 months in spherical equivalent, astigmatism, central corneal thickness or endothelial cell density. In addition, at 24 months, 77.3 percent of patients in the fresh corneal tissue group and 73.1 percent of the GCCT patients reached 0.3 or better BCVA. Laser-scanning confocal microscopy confirmed that the GCCT was acellular at two weeks, indicating that all cells were not viable after glycerin-cryopreservation—a finding that may have key implications for stromal rejection in DALK.

The researchers conclude that GCCT for DALK may be the preferred alternative because it has the potential to minimize graft rejection while enlarging the source of donor tissue.

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