Journal Highlights

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

Ophthalmology

Short-Term Ranibizumab Superior to Focal/Grid Laser Treatment

November's *Ophthalmology*

In a prospective, interventional, multicenter clinical trial involving 126 patients with diabetic macular edema, **Nguyen et al.** have found that over a six-month period, intraocular injections of ranibizumab provide a significantly better visual outcome than focal/grid laser treatment.

Participants were randomized into three groups of 42 patients each. Group 1 received 0.5 mg of ranibizumab at baseline and months 1, 3 and 5; group 2 received focal/grid laser photocoagulation at baseline and month 2 if needed; and group 3 received a combination of 0.5 mg of ranibizumab and focal/grid laser at baseline and month 3. At six months, the mean gain in BCVA was significantly greater in group 1 (+7.24 letters) than in group 2 (–0.43 letters). Group 3 (+3.80 letters) was not statistically different from groups 1 and 2.

The authors conclude that these results support the more aggressive regimen of monthly injections of ranibizumab for two years that is being utilized in the RISE and RIDE phase 3 trials sponsored by Genentech.

Aqueous Humor Sampling in Ocular Clinical Drug Trials

November's *Ophthalmology*

Campochiaro et al. conducted a study to determine whether aqueous taps could be used to investigate molecular targets for retinal diseases and/or to assess intraocular drug levels.

The study involved 40 patients with macular edema due to central or branch retinal vein occlusion (CRVO or BRVO), 11 patients with diabetic macular edema (DME) and eight patients with age-related macular degeneration. The researchers found that it was possible to perform serial aqueous taps, as patients did not experience complications or discomfort. They also found that measurements of pro-permeability proteins could be made in aqueous. Aqueous levels of vascular endothelial growth factor were significantly higher in patients with DME than in patients with CRVO. VEGF levels in patients with CRVO were significantly higher than those in patients with BRVO. Patients with AMD had levels in an intermediate range, significantly higher than those in patients with BRVO. They also discovered they could measure ranibizumab in aqueous.

Aqueous samples may provide a valuable tool when conducting clinical trials investigating potential involvement of molecular targets in disease and for pharmacokinetic or pharmacodynamic studies in drug trials.

Adenocarcinoma From Congenital Hypertrophy of Retinal Pigment Epithelium

November's *Ophthalmology*

For years, researchers believed that solitary congenital hypertrophy of the retinal pigment epithelium (CHRPE) was stationary. Now, a case report by **Shields et al.** describes an adenocarcinoma arising from CHRPE.

In 1995, a 56-year-old African-American patient presented with an asymptomatic fundus lesion in her left eye. While the lesion had typical features of CHRPE, a small elevated nodule within the flat component was observed, and the patient was diagnosed with adenoma of the retinal pigment epithelium arising from CHRPE. In March 2008, the patient returned with a visual acuity of hand motions. There was no view of the fundus due to advanced cataract and posterior synechia. Ultrasonography showed a total retinal detachment and a pedunculated tumor 7.5 mm in thickness. With a final diagnosis of adenocarcinoma arising from CHRPE, the patient elected to undergo enucleation.

The authors conclude that earlier

treatment rather than prolonged observation may be justified for progressive lesions.

Adding Methotrexate to Treat Ocular Inflammatory Disease

November's *Ophthalmology*

Gangaputra et al. have found that adding methotrexate to an anti-inflammatory regimen not involving other noncorticosteroid immunosuppressive drugs is moderately effective for managing inflammatory activity and achieving corticosteroid-sparing objectives. However, not all patients experience therapeutic success, and others may need many months of treatment.

In this retrospective cohort study, 384 patients (639 eyes) treated at four U.S. ocular inflammation referral centers were followed from the point when methotrexate was added to their treatment. Complete suppression of inflammation sustained for 28 days or more and corticosteroid-sparing success were each achieved within six months, respectively, as follows: for anterior uveitis, 55.6 percent and 46.1 percent; for intermediate uveitis, 47.4 percent and 41.3 percent; for posterior uveitis or panuveitis, 38.6 percent and 20.7 percent; for scleritis, 56.4 percent and 37.3 percent; and for ocular mucous membrane pemphigoid, 39.5 percent and 36.5 percent. Methotrexate was discontinued within one year by 42 percent of patients due to ineffectiveness and side effects, which were typically reversible.

Amblyopia and Strabismus Prevalence in Baltimore Study

November's *Ophthalmology*

The Baltimore Pediatric Eye Disease Survey assessed the prevalence of strabismus and amblyopia among African-American and Caucasian children aged 6 months through 71 months living in Baltimore and adjacent Baltimore County. Among 4,132 children identified, 3,990 eligible children (97 percent) were enrolled and 2,546 (62 percent) were examined.

Friedman et al. found that overall prevalence of strabismus was 2.1 percent in African-Americans and 3.3 percent in Caucasians—not a statistically significant difference. Exotropia and esotropia were found equally often in both racial groups and were about three times more frequent in children over the age of 1 than in children in the first 12 months of life. In children 30 months to 71 months, the amblyopia prevalence was 1.8 percent for Caucasians and 0.8 percent for African-Americans—also not statistically significant.

National population projections show approximately 677,000 cases of manifest strabismus among U.S. children 6 months to 71 months and 271,000 cases of amblyopia among children 30 months to 71 months.

American Journal of Ophthalmology

Lamellar Keratoplasty vs. Penetrating Keratoplasty in Keratoconus

November's *AJO*

In a retrospective cohort study, **Han et al.** compared outcomes after penetrating keratoplasty and two techniques of deep anterior lamellar keratoplasty (DALK) in patients with keratoconus.

The researchers included 125 corneal transplantations comprising 100 PK and 25 DALK procedures for keratoconus. DALK was performed with the modified Anwar technique (DALKa group) in 14 eyes, and manual lamellar keratoplasty (DALKm group) was performed in 11 eyes.

At 12 months, the DALKa and PK groups achieved a logMAR best-corrected visual acuity of 0.15 and 0.27, respectively, whereas the mean best-corrected visual acuity of the DALKm group was 0.41. Significance level was achieved between the DALKa and DALKm groups. There was no significant difference in the mean spherical equivalent and astigmatism between the PK and DALK groups. The DALK groups had a significantly lower incidence of complications than the PK cases, including allograft rejection and glaucoma. Graft survival rate of both the PK and DALKa groups was 100 percent, whereas that of the DALKm group was 73 percent at three years after surgery.

Visual acuity outcomes of the DALKa technique are comparable with those of PK for keratoconus, whereas both types of DALK surgery result in fewer postoperative complications than PK. DALKa is emerging as a preferred choice among the lamellar techniques for better optical outcome.

Bevacizumab in Inflammatory Eye Disease

November's *AJO*

In a retrospective, noncomparative, interventional case series, **Lott et al.** studied the effect of intravitreal bevacizumab on visual acuity and macular thickness in patients with inflammatory choroidal neovascularization or cystoid macular edema.

Each eye received 1.25 mg of intravitreal bevacizumab at baseline. Follow-up examinations were scheduled at one- to two-month intervals with additional injections at the discretion of the physician.

Comprehensive evaluations, including Snellen BCVA and optical coherence tomography measurements, were performed at each visit. Main outcome measures were BCVA and central subfield thickness as measured by optical coherence tomography.

The researchers identified 34 eyes of 30 patients with inflammatory CNV or CME. Median ages were 52 years and 67 years for the CNV and CME groups, respectively. The median length of follow-up for CNV eyes was seven months while the median follow-up for CME eyes was 13 months. Both groups received a median of two injections. For eyes with CNV, BCVA improved significantly at the first follow-up month but was not different from baseline thereafter; central subfield thickness remained unchanged throughout follow-up. For eyes with CME, neither BCVA nor central subfield thickness changed significantly over the course of follow-up.

Associations of Eye Diseases With Self-Reported Physical and Mental Health

November's *AJO*

Lee et al. studied the associations of eye diseases and visual symptoms with the most widely used health-related quality-of-life (HRQOL) generic profile measure. HRQOL was assessed using the short form-36 (SF-36) version 1 survey administered to a sample of patients receiving care provided by an independent association of physician groups located primarily in the western United States.

Eye diseases, ocular symptoms and general health were assessed in a sample of patients from 48 physician groups. A total of 18,480 surveys were mailed out and 7,093 returned; 5,021 of these had complete data. Multiple linear regression models were used to examine the decrements in self-reported physical and mental health associated with eye diseases and symptoms, including trouble seeing and blurred vision.

Nine percent of the respondents had cataracts, 2 percent had age-related macular degeneration, 2 percent had glaucoma, 8 percent had blurred vision and 13 percent had trouble seeing. Trouble seeing and blurred vision both had statistically unique associations with worse scores on the SF-36 mental health summary score. Only trouble seeing had a significant association with the SF-36 physical health summary score.

While these ocular symptoms were significantly associated with SF-36 survey scores, having an eye disease (cataract, glaucoma and macular degeneration) was not significantly associated—after adjusting for other variables in the model.

These results suggest an important link between visual symptoms and general HRQOL. The study extends the findings of prior research to show that both trouble seeing and blurred vision have independent and measurable associations with HRQOL, while the presence of specific eye diseases may not.

Archives of Ophthalmology

Cost-Utility of Cataract Surgery Using Visual Acuity Outcomes

September's *Archives*

Lansingh and Carter calculated the cost-utility of cataract surgery by using visual acuity outcomes from many studies in different countries and converting them to utility values using published time trade-off approach data.

Preoperative visual acuity was highly and significantly correlated with increasing gross national income per capita; the results showed that, in developing countries, preoperative vision was much poorer compared with developed countries. However, the correlation between postoperative visual acuity and gross national income per capita, while still high, showed a much flatter slope.

The mean utility gain for developed countries was less than the mean utility gain for developing countries. Cost-utility for cataract surgery ranged from $3.50 to $834 per quality-adjusted life year in developing countries to $159 to $1,356 in developed countries. In the developing world, China and Brazil had the highest cost-utility values, while Nepal and India had the lowest values. In developed countries, Australia, Finland and the United States had the highest cost-utility values while cost-utility values were the lowest in Canada. The results also showed that the greater the difference in visual acuity between the operated-on and companion eye, the more the approximated utility gain overestimated the true utility gain.

The authors conclude that the cost-utility of cataract surgery calculated by their approach was much less compared with methods using indirect approaches. To estimate true cost-utility, corrections must be made when the difference in visual acuity between the operated and companion eye is large. In addition, the direct costs of surgery used in their approach are far less than societal costs, and this must also be taken into account.

Glaucoma With Early Visual Field Loss Affecting Both Hemifields

September's *Archives*

De Moraes et al. investigated the predictive value of baseline glaucomatous achromatic visual field loss on the rate of visual field progression.

From a database of 43,660 consecutive subjects (132,512 visual field tests), the authors selected a group of patients with 10 or more 24-2 SITA-Standard visual field tests with early baseline visual field loss.

Different variables known to be associated with increased risk of visual field progression were collected at baseline and tested in a multivariate statistical model. Among these different variables, the authors compared the role of presenting reproducible baseline visual loss in both hemifields vs. a single hemifield. The authors further evaluated visual field progression using automated pointwise linear regression analysis.

The authors investigated 205 eyes of 205 glaucoma patients with a mean of 12 visual field tests spanning an average of 6.5 years. Multivariate analysis revealed the most significant predictors of future fast visual field progression to be higher baseline IOP, decreased central corneal thickness and presence of damage in both hemifields. Eyes with damage to both hemifields progressed twice as fast as those with single hemifield involvement and had a 62 percent increased risk of reaching a progression endpoint.

The authors conclude that glaucomatous damage in both hemifields in eyes with mild baseline visual field loss should be considered at increased risk of progression and therefore may require more aggressive glaucoma therapy to prevent irreversible visual deterioration.

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.*

ROUNDUP OF OTHER JOURNALS

25-Gauge Vitrectomy for Primary Rhegmatogenous Retinal Detachment

Retina
Published online July 22, 2009

A case series involving 131 consecutive patients has shown that 25-gauge transconjunctival vitrectomy represents an effective approach to managing primary rhegmatogenous retinal detachment (RRD). **Mura et al.** limited their review to patients with a minimum follow-up of three months and no prior ocular surgery except laser photocoagulation. Exclusion criteria included signs of grade C or greater proliferative vitreoretinopathy and a history of anterior segment optical opacity that would preclude visualization of the posterior pole.

The surgeons used a "limited-vitrectomy" approach, removing the central core followed by the peripheral vitreous in the area adjacent to the retinal tears. Vitreous was shaven to relieve all tractional forces above and around the retinal tears. At three months, the success rate was 92.4 percent with visual acuity improving from 20/50 to 20/32. Ten patients (7.6 percent) experienced a redetached retina within a mean of 38 days due to either proliferative vitreoretinopathy or a new retinal tear.

Willingness to Pay to Reduce Wait Time for Cataract Surgery

Investigative Ophthalmology & Visual Science
2009;50:3636–3642

Many cataract patients face long wait times for surgery in the public sector. Are they willing to pay more money for private operations that would reduce the wait time? According to a study by **Chan et al.**, the answer is yes, some patients would pay extra. For this study, 467 individuals on cataract surgical waiting lists participated in an interview that covered three topics: private insurance coverage, preferred waiting time and amount willing to pay for surgery.

Of the 300 individuals who completed the telephone interview, 48.2 percent were 76 years of age or older, 59 percent were women and the mean wait time for surgery was 17 ± 15 months. Of the 220 participants (73.3 percent) willing to pay anything for surgery, the mean amount was $552 ± $443. With adjustment for age, education and monthly household income, participants willing to pay anything were less willing to wait 12 months for surgery, more likely to know someone having had cataract surgery, more likely to have lower visual function and more likely to use their own savings to pay for the surgery.

Diabetes Does Not Influence Macular Thickening After Cataract Surgery

Eye
Published online July 10, 2009

Biró and Balla used optical coherence tomography to assess the effect of diabetes on the thickening of the macular regions following cataract surgery. This study involved 18 eyes of 18 diabetic patients and 53 eyes of 53 nondiabetic patients who underwent uneventful cataract surgery. The values of the operated eye were compared to the values of the fellow, nonoperated eye in both groups. The authors measured retinal thickness values of the foveal and perifoveal sectors on the day prior to surgery and on days 1, 7, 30 and 60 following surgery.

No significant thickness change in any sectors of the foveal and perifoveal retina were found in the diabetic group on postoperative day 1 as compared to the corresponding preoperative values. A significant increase could be detected, however, on postoperative days 7, 30 and 60 in the diabetic group, similarly to the nondiabetic one.

No significant difference could be detected in the thickness value in any macular regions between the corresponding diabetic and nondiabetic groups on the preoperative and postoperative 1, 7, 30 and 60 days either in the operated or in the control eyes.

Blue-Light Filtering IOLs

Investigative Ophthalmology & Visual Science
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Research has shown that oxidative stress may be important in the pathogenesis of age-related macular degeneration and that short-wavelength (blue) light damage could play a key role in this condition. Macular pigment may protect against AMD because it absorbs short-wavelength (blue) light at a prereceptoral level and because of its antioxidant properties. Some have hypothesized that cataracts may provide protection against AMD by absorbing blue light. In addition, cataract surgery has been shown to be an independent risk factor for the development or progression of AMD.

Nolan et al. conducted a study comparing a standard AcrySof single-piece acrylic intraocular lens with the Alcon AcrySof Natural intraocular lens—a yellow (blue-light filtering) IOL. They looked at macular pigment optical density by measuring macular pigment at baseline and at three, six and 12 months after implantation. Their study shows evidence that the blue-filtering IOL results in augmentation of macular pigment optical density.

The importance of this finding rests on the fact that any benefits associated with augmentation of macular pigment optical density in terms of AMD prevention or progression (which is yet to be proven) will be conferred on patients implanted with a blue-filtering IOL at the time of cataract surgery, and may be of importance in an era when implantation often occurs at an earlier stage in a patient's lifetime.

Roundup of Other Journals *is written by Lori Baker Schena and edited by Deepak P. Edward, MD.*