

Journal Highlights

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

Ophthalmology

Psychological Impact of Vision Loss

Ophthalmology

Published online Jan. 5, 2015

Irreversible vision loss (IVL) is especially challenging for ophthalmologists because rehabilitation outcomes are strongly dependent on the patient's psychological adjustment to illness and impairment. In this meta-analysis of IVL in adults, **Senra et al.** found that it has a negative, long-lasting effect on quality of life and mental health.

The researchers selected 52 studies published between 1946 and 2014 that examined adjustment to IVL. Most were observational and cross-sectional in nature. Risk of bias was assessed using the Cochrane risk-of-bias tool for randomized controlled trials and the RTI Item Bank for Assessing Risk of Bias and Confounding for Observational Studies of Interventions or Exposures.

From their review of the literature, the researchers found that mental health issues tend to emerge in the early stages of adaptation to vision loss and remain fairly constant over time—especially in patients who have certain progressive conditions such as diabetic retinopathy. As a result, patients should be referred to appropriate care, including both mental health services and vision rehabilitation pro-

grams, early in the adaptation process.

The researchers also suggested that clinicians assess patients' psychological resilience, social support networks, and practical coping strategies, as these are good predictors of whether a person will find a measure of emotional stability that can be sustained over time.

SD-OCT and Vitreoretinal Interface Abnormalities

Ophthalmology

Published online Dec. 30, 2014

Meuer et al. used spectral-domain optical coherence tomography (SD-OCT) to estimate the prevalence and interrelationships of several vitreoretinal interface abnormalities. They found that the frequency of two disorders—epiretinal membranes (ERMs) and vitreomacular traction—increase with age and are associated with macular cysts, lamellar macular holes, and visual impairment.

For this population-based study, the researchers evaluated 1,913 participants in the Beaver Dam Eye Study. Of these, 1,540 patients (2,980 eyes) had gradable SD-OCT scans of the macula in at least one eye. Prevalence rates for abnormalities were estimated as follows: ERMs, 34.1

percent; paravascular cysts, 20 percent; macular cysts, 5.6 percent; lamellar macular holes, 3.6 percent; and vitreomacular traction, 1.6 percent.

The prevalence of macular cysts, ERMs, and vitreomacular traction increased with age. The prevalence of paravascular cysts, however, decreased with age, and the researchers found no relationship between lamellar macular holes and age. Eyes with a history of cataract surgery were more likely to have macular cysts, lamellar macular holes, and ERMs; in addition, macular cysts and ERMs were more common in eyes with retinal diseases such as proliferative diabetic retinopathy, retinal vein occlusion, and retinal detachment.

After adjusting for age and sex, the researchers also found that macular cysts, paravascular cysts, lamellar macular holes, vitreomacular traction, and visual impairment were more frequent in eyes with ERMs than in eyes without ERMs.

According to the researchers, two of the main strengths of this study were the use of standardized protocols for measurements and the systematic grading of stereoscopic photographs and SD-OCT scans. One limitation was the limited power to detect associations in eyes with very infrequent conditions.



They concluded that further follow-up is necessary to better examine SD-OCT as a tool for risk assessment.

Communication and Adherence to Glaucoma Regimen

Ophthalmology

Published online Dec. 24, 2014

What can ophthalmologists do to increase patient adherence to a glaucoma medication regimen? **Slenth et al.** found that the simplest strategy—giving advice on how to accurately administer the drops—is the most effective.

For this prospective, observational cohort study, the researchers enrolled 279 patients at six ophthalmology clinics across the United States. Fifteen ophthalmologists participated in the study as well, and all patient visits were recorded on video. Adherence was assessed for 60 days after the patients' initial appointments.

The researchers found that physician-provided patient education—such as information on the disease process, the purpose of glaucoma medications, and the potential for medication side effects—had little to no effect on adherence. In contrast, providing patients with practical tips on how to place the drops in the eye and advising them on how long to wait between administering two different drops had a significant positive impact on adherence. And in a positive feedback loop, those patients who reported feeling self-confident with regard to using their medications were more likely to follow their physicians' recommendations.

The researchers also found that black patients were significantly less likely to adhere to their prescribed regimen. This finding is consistent with earlier studies.

The researchers recommended that physicians simplify their patients' medication regimens whenever possible, as patients who were prescribed more complex medication schedules were less likely to take their doses on time and less likely to take the correct number of prescribed doses each day.

SD-OCT and Hydroxychloroquine Retinopathy

Ophthalmology

Published online Dec. 16, 2014

How effective is spectral-domain optical coherence tomography (SD-OCT) in screening patients for hydroxychloroquine (HCQ) retinopathy? **Johnston et al.** found that it has poor positive predictive value and cannot reliably predict incipient HCQ retinal toxicity when used by itself as a screening tool.

For this study, the researchers evaluated 192 patients who were taking HCQ for various rheumatologic conditions. Median duration of therapy was 9.8 years, and median cumulative dosage was 14.4 g/kg. They used a combination of four standard tests—visual acuity, qualitative and quantitative perimetric visual fields, and fundus examination—for comparison with qualitative and quantitative SD-OCT findings.

A patient's eye was considered affected if two or more of the standard tests were abnormal. SD-OCT findings were considered abnormal if there was loss of the inner/outer segment line, thinning of the outer nuclear layer, or downward displacement of inner retinal layers.

Two patients were found to have HCQ retinopathy based on both SD-OCT and standard testing. Eight other patients had conflicting test results: Six patients had at least two abnormal standard tests with a qualitatively normal SD-OCT, and two had normal standard tests with a qualitatively abnormal SD-OCT. In addition, the number of abnormal eyes identified by qualitative SD-OCT diverged from that identified by quantitative SD-OCT.

Overall, the researchers concluded that in the presence of an abnormal clinical examination, a qualitatively abnormal SD-OCT is pathognomonic of HCQ retinopathy; however, a qualitatively normal SD-OCT cannot exclude HCQ retinopathy when visual fields or fundus examination are abnormal because of low sensitivity.

They therefore proposed minimum retinal thickness measurements to provide additional guidance in the case of equivocal test results.

American Journal of Ophthalmology

Cataract Surgery Complicated by Anterior Capsule Tear

March *AJO*

Carifi et al. studied the results of phacoemulsification cataract surgery complicated by anterior capsule tear and found that tears often lead to additional intraoperative complications and a relatively high incidence of secondary interventions. Permanent visual loss and worsening refractive outcomes were also observed in cases where the lens was implanted outside the bag.

This retrospective case series included 239 study eyes with intraoperative anterior capsule tears and 211 controls that underwent uneventful cataract surgery. Exclusion criteria included combined surgical procedures, planned manual extracapsular cataract extraction, and a history of previous intraocular surgery or eye trauma. The main outcome measures were intraoperative capsule complication rates, refractive and visual outcomes, and incidence of short-term postoperative complications.

Among the 239 study eyes, planned phacoemulsification was converted to manual extraction in five eyes (2 percent). Concurrent posterior capsule ruptures occurred in 58 eyes (24 percent), with vitreous loss in 38 (16 percent) and dropped nuclear lens material in 11 (5 percent). In addition, 27 eyes (11 percent) underwent unplanned secondary surgical procedures, and permanent visual loss occurred in four (1.7 percent).

Refractive analysis was based on 187 study eyes. Overall, 146 eyes (78.1 percent) were within 1.00 D of intended postoperative refraction, while only 79 (42.2 percent) were within 0.50 D of target; these results were significantly worse than the outcomes observed in the control group.

Dry Eye Disease, Depression, and Anxiety

March *AJO*

In this retrospective case-control study, **van der Vaart et al.** investigated the relationship between dry eye disease and mental illness and found a significant association between dry eye disease and both depression and anxiety. Because treatment of coexisting depression has been shown to improve control of other chronic medical conditions, they suggested that similar improvement may also occur in patients with dry eye.

The researchers performed a chart review of all individuals over the age of 18 years seen in University of North Carolina outpatient clinics between July 2008 and June 2013. Cases were defined according to ICD-9 diagnosis codes for dry eye disease, anxiety, and depression; and odds ratios were calculated between dry eye disease and each of the two mental illnesses. To validate their methodology, the investigators also calculated similar odds ratios between dry eye disease and rheumatoid arthritis, a systemic disease that has a known association with dry eye.

Of the 460,611 patients screened, 7,207 were diagnosed with dry eye, 20,004 were diagnosed with anxiety, and 30,100 were diagnosed with depression. The estimated odds ratio was 2.9 for dry eye disease and depression and 2.8 for dry eye disease and anxiety. (The odds ratio for dry eye disease and rheumatoid arthritis was 3.2.)

The authors concluded that ophthalmologists should be aware of this association and consider referral and treatment for coexisting depression and anxiety as an additional therapeutic measure.

Endogenous Endophthalmitis Among Hospitalized Patients

March *AJO*

Vaziri et al. identified potential risk factors associated with endogenous endophthalmitis among hospitalized patients with hematogenous infections. They found that while

endogenous endophthalmitis is rare in this setting, children and middle-aged patients were at greater risk, as were those patients with longer hospital stays and those admitted to intensive care units.

In this retrospective, cross-sectional study, the researchers reviewed Medicare Supplemental and Coordination of Benefit inpatient databases from the years 2007 to 2011. Using ICD-9 codes, the researchers calculated logistic regression to identify potential predictors and comorbidities for developing endophthalmitis.

Among inpatients with hematogenous infections, the overall incidence rate of presumed endogenous endophthalmitis was between 0.05 percent and 0.4 percent for those with fungemia, and 0.04 percent for those with bacteremia. In addition, the following diseases and conditions were significantly associated with a diagnosis of endophthalmitis: HIV/AIDS, tuberculosis, endocarditis, bacterial meningitis, fungal meningitis, internal organ abscess, lymphoma/leukemia, skin abscess/cellulitis, pyogenic arthritis, diabetes with ophthalmic manifestations, and urinary tract infection. The researchers also found that patients younger than 17 years of age and those between the ages of 45 and 64 were more likely to be diagnosed with endogenous endophthalmitis, as were sicker patients (measured by length of hospital stay and admission to intensive care units).

They concluded that these readily identifiable patient characteristics can help ophthalmologists predict patients' risk of developing endogenous endophthalmitis from bacteremia or fungemia and may assist with triaging decisions in screening for patients with hematogenous infections.

Morbidity and Mortality in AMD Patients Treated With Anti-VEGF

March *AJO*

In this population linkage study, **Ng et al.** described the rates of myocardial infarction (MI), stroke, and death in patients treated with intravit-

real anti-VEGF for age-related macular degeneration (AMD). They found that the incidence rates were not significantly higher than age-adjusted rates in the general population.

The researchers identified patients 40 years of age and older who received treatment with intravitreal anti-VEGF for AMD from Jan. 1, 2008, to Dec. 31, 2011, at the Singapore National Eye Centre. They then used a national record linkage database to identify those who either died or experienced MI or stroke after the first injection and compared these rates to those of the total Singapore population.

A total of 1,182 patients were included in this analysis, with the majority receiving bevacizumab. Overall, there were 19 cases of MI, 16 cases of stroke, and 43 deaths, giving an age-adjusted incidence rate of 350.2 per 100,000 person-years for MI, 299.3 per 100,000 person-years for stroke, and 778.9 per 100,000 person-years for death. This was comparable to the weighted incidence rates of the Singapore population (427.1 per 100,000 person-years for MI, 340.4 per 100,000 person-years for stroke, and 921.3 per 100,000 person-years for death).

The researchers noted that they were unable to include the prevalence of other known risk factors for MI and stroke, such as hypertension and smoking, in their study design.

JAMA Ophthalmology

Comparing Severity, Incidence, and Progression of AMD in Both Eyes

February *JAMA Ophthalmology*

As part of the longitudinal, population-based Beaver Dam Eye Study, **Gangnon et al.** investigated the effect of AMD progression and regression in one eye (the primary eye) on the status of the fellow eye and determined that the severity of AMD in the one does indeed track that of the other at all stages of the disease.

Examinations were performed every five years over a 20-year period, and retinal photographs were taken at baseline and at no more than four sub-

sequent occasions. Study participants (n = 4,379) were between the ages of 43 and 86 at baseline. Incidence, progression, and regression of AMD were assessed by use of the Wisconsin Age-Related Maculopathy Grading System on retinal photographs.

The researchers found that more severe AMD in the primary eye was associated with increased incidence of AMD and accelerated progression in the fellow eye at all disease stages. In addition, less severe AMD in the primary eye was associated with less progression of AMD in the fellow eye. The researchers estimated that 51 percent of participants who developed any AMD maintained AMD severity states of within one step between eyes, while 90 percent stayed within two steps.

Primary Ocular Adnexal Diffuse Large B-Cell Lymphoma

February *JAMA Ophthalmology*

Munch-Petersen et al. investigated the clinical features of ocular adnexal diffuse large B-cell lymphoma (OA-DLBCL) and found that most patients with primary OA-DLBCL had Ann Arbor stage IE and TNM T2 disease.

This 30-year retrospective study included 100 patients with OA-DLBCL from six eye cancer centers. Median follow-up was 52 months. In all, 57 patients were diagnosed with primary OA-DLBCL, 29 were diagnosed with OA-DLBCL and concurrent systemic lymphoma, and 14 were diagnosed with a relapse of lymphoma in the ocular adnexal region.

The researchers also analyzed the prognostic utility of the two staging systems (Ann Arbor and TNM) that currently exist for ocular adnexal lymphomas. Unlike the Ann Arbor system, the TNM method employs site-specific categories to stage disease: T describes the primary tumor, N describes the regional lymph nodes, and M describes any distant metastasis. Of the 57 patients with primary OA-DLBCL, 53 (93 percent) had Ann Arbor stage IE disease, and four (7 percent) had Ann Arbor stage IIE disease. According to

the TNM staging system, 43 (75.4 percent) had T2 tumors.

Five-year overall survival for primary OA-DLBCL was between 2.5 and 4.5 years. Relapse occurred in 25 patients (43.9 percent), and women had a longer median survival rate than men. The researchers found that further subdividing the T category of the TNM staging system was predictive of survival rates in primary OA-DLBCL, whereas the Ann Arbor system was not. However, Ann Arbor staging became predictive of survival when all 100 patients were taken into account.

Diabetes Eye Screening in Minority Populations

February *JAMA Ophthalmology*

Owsley et al. examined the effectiveness of noninvasive diabetic retinopathy (DR) screening using a nonmydriatic camera combined with a telemedicine reading center. DR was successfully identified in approximately 1 of every 5 people with diabetes. Other ocular conditions were also detected at a high rate, the researchers noted, which is a currently underappreciated collateral benefit of DR screening programs.

As part of the Innovative Network for Sight Research (INSIGHT) cross-sectional study, the researchers focused on screening settings accessible to patients with diabetes in four U.S. cities, including primary care clinics and pharmacies providing services to largely uninsured and/or minority populations. Participants included persons aged 18 years or older who had type 1 or 2 diabetes.

Of the 1,894 participants in this INSIGHT screening program, 21.7 percent had DR in at least one eye—a rate similar to that reported in previous studies using telemedicine reading centers. The most common type of DR was background DR, which was present in 94.1 percent of those with DR. Almost one-half (44.2 percent) of the participants screened had ocular findings other than DR, the most common of which were cataracts (30.7 percent), hypertensive retinopathy (16.7

percent), and cotton-wool spots (11.1 percent).

Efficacy of Selective Laser Trabeculoplasty in Primary Angle-Closure Glaucoma

February *JAMA Ophthalmology*

Narayanaswamy et al. assessed the intraocular pressure (IOP)–lowering efficacy of selective laser trabeculoplasty (SLT) in eyes with primary angle closure (PAC) and PAC glaucoma (PACG). They found that although eyes with PAC or PACG respond to SLT in the short term, the overall long-term therapeutic effectiveness requires further evaluation.

This trial included 100 patients diagnosed with PAC or PACG in which the angles had opened at least 180 degrees after laser iridotomy. They were randomly assigned to either SLT or prostaglandin analogue (travoprost). SLT was repeated if the IOP reduction was less than 20 percent from baseline at the one- or three-month follow-up. The researchers could not identify any significant differences between the SLT and travoprost groups in terms of absolute mean reduction of IOP (4.0 vs. 4.2 mmHg, respectively) or the percentage of reduction in IOP (16.9 percent vs. 18.5 percent, respectively) at six months. Complete success (IOP of no more than 21 mmHg without medication) was achieved in 60 percent of eyes in the SLT group compared with 84 percent of eyes in the travoprost group. Additional medications were required in 22 percent of patients in the SLT group compared with 8 percent in the travoprost group. One patient in the SLT group had a posttreatment IOP spike greater than 5 mmHg; no other events such as persistent uveitis or increase in peripheral anterior synchiae were noted.

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

Latanoprost Preserves Vision in Open-Angle Glaucoma

Lancet

Published online Dec. 19, 2014

Garway-Heath et al. assessed the ability of latanoprost to prevent vision loss in patients with open-angle glaucoma (OAG) and found that the drug was effective at preventing visual field (VF) loss in a short observation period.

The researchers enrolled 516 patients with newly diagnosed OAG and randomized them to receive either placebo or latanoprost 0.005 percent, once a day.

Baseline mean intraocular pressure (IOP) was 20.1 mmHg in the control group (n = 258) and 19.6 mmHg in the treatment cohort (n = 258). A strong initial pattern of IOP reduction diminished after six months. By the 24-month mark, mean IOP had dropped by 0.09 mmHg in the control group and by 3.8 mmHg in the latanoprost group.

With regard to VF preservation, 94 patients had VF deterioration consistent with glaucomatous progression during the study. Of these, 59 were in the control group and 35 were in the treatment cohort. In addition, time to first deterioration was longer in the latanoprost group than in those who received placebo drops.

Rapid Corneal Cross-Linking Produces Negative Outcomes

Investigative Ophthalmology & Visual Science
2014;55(12):8371-8376

Brittingham et al. compared outcomes seen with two corneal cross-linking (CXL) protocols—standard and rapid—for keratoconus. They found that when compared with standard CXL protocol, rapid CXL negatively influenced the occurrence and depth of the demarcation line in the early posttreatment period.

For this retrospective analysis, the researchers evaluated 131 eyes with

progressive keratoconus. Two treatment protocols were used: the standard Dresden protocol (30 minutes irradiation, 3 mW/cm²) or a rapid protocol (10 minutes irradiation, 9 mW/cm²). The presence and depth of the corneal demarcation line was assessed one month after treatment.

Sixty-two of the 81 corneas (76.5 percent) treated with the standard protocol revealed a demarcation line one month after treatment. In contrast, only 11 of the 50 corneas (22 percent) treated with the rapid protocol revealed a demarcation line at that time. Moreover, the demarcation line was significantly more superficial in this rapid protocol group.

Glaucoma and Automobile Accidents

PLoS One

2014;9(12):3115572

Does the presence of glaucoma contribute to the likelihood of having a car accident? Yuki et al. found no direct correlation between central binocular visual field (VF) damage and a history of car accidents in a group of patients with primary open-angle glaucoma (POAG).

The researchers evaluated 371 patients with POAG and asked them to answer a number of questions regarding their driving experience and habits. After further analysis, data was available for 247 patients. Of this group, 196 (79.4 percent) had no history of a car accident. Those who had experienced an accident tended to limit their driving.

In evaluating those who previously had an accident, no association emerged between the patients' accident history and their integrated binocular VFs. In addition, none of the principal components that might play a role in driving safety (including visual acuity in the better- and worse-seeing eye) were related to accident history.

Roundup of Other Journals is written by Jean Shaw and edited by Deepak P. Edward, MD.

Coming in the next EyeNet

Feature

Toric IOL Alignment A look at intraoperative and surgical planning devices designed to improve surgical accuracy with astigmatism-correcting IOLs. Do they live up to the promise?

Clinical Update

Pediatrics New research supports binocular therapy for amblyopia.

Quality of Care Growing role of patient satisfaction poses challenges.

Pearls

The challenges of managing choroidal neovascularization in the highly myopic patient.

Savvy Coder

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