News in Review

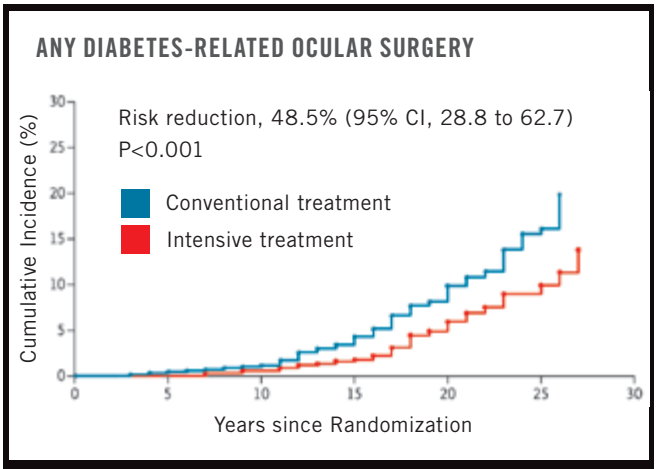
COMMENTARY AND PERSPECTIVES

Diabetes Control & Rates of Eye Surgery

In a striking sequel to a landmark diabetes study, researchers reported that early intensive glycemic control markedly lowers the long-term risk of having ocular surgery in patients with type 1 diabetes.[1] Early intensive control was linked with a 48% reduction in the risk of any diabetes-related ocular surgery, a 37% reduction in all ocular procedures, and a 32% reduction in surgical costs over conventional diabetes therapy.

Original study. In the Diabetes Control and Complications Trial (DCCT), 711 patients were randomized to intensive glycemic control and 730 to conventional diabetes therapy between 1983 and 1989. In follow-up through 1993, the DCCT showed that 6.5 years of early intensive control to near-normal glycemia was associated with a 76% reduction in the onset of retinopathy and a 52% reduction in disease progression.

Continuing follow-up. At the end of DCCT, all patients, regardless of their original treatment assignment, were offered a rigorous intensive glycemic control regimen. Of the 1,441 DCCT patients, 1,375 enrolled in the follow-on Epidemiology of Diabetes Interventions and Complications (EDIC) study. Those who had undergone early intensive treatment continued to fare better for up to 27 years after the start of the original DCCT. They had fewer microvascular and macrovascular complications than those who had initially received conventional therapy. This result is attributable to "metabolic memory," a phenomenon seen in diabetes, in which the early glycemic environment exerts a long-term effect on target organs, even after the glycemic status changes.



PERSISTENT BENEFIT. Early intensive diabetes control continues to benefit patients for 25 or more years.

Dramatic drop. These results hinted at the impact early treatment might have on the incidence of ocular surgeries, self-reported by patients, said Lloyd Paul Aiello, MD, PhD, a member of the DCCT/EDIC writing committee. Dr. Aiello is at the Beetham Eye Institute, Joslin Diabetes Center, and Harvard Medical School in Boston. "But the magnitude of the effect we observed was dramatic, and this surprised many people."

Early intensive control led to a substantial drop in the risk of ocular procedures related to diabetes. Cataract surgery was performed in 42 patients (5.9%) who had received intensive therapy during DCCT compared with 61 (8.4%) who had received conventional therapy. With regard to vitreoretinal

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procedures, 29 intensive-therapy patients (4.1%) versus 50 conventional-therapy patients (6.8%) underwent vitrectomy, retinal detachment surgery, or both. Other surgeries, including glaucoma surgery, showed a similar trend, said Dr. Aiello, but the number of procedures performed was too small to attain statistical significance.

Consistent results. In DCCT and EDIC, the researchers observed 2 cohorts—those with no retinopathy at baseline (primary cohort) and those with retinopathy at baseline (secondary cohort). "Not surprisingly, those starting with some retinopathy ended up with more complications and therefore more surgeries," said Dr. Aiello. Even though the incidence of surgeries in the secondary cohort was about twice that of the primary cohort, he said that both groups showed benefits from early intensive control.

This is all good news for patients and physicians, said Dr. Aiello, but it places responsibility on both groups to work together diligently to achieve glycemic control as early as possible. Once a patient has been diagnosed with diabetes, the physician can use the results of this study to help motivate the patient to maintain tight control.

Although the study was confined to type 1 diabetes, said Dr. Aiello, there's no reason to believe the results would be substantially different for type 2 diabetes. "We know from other studies that with type 2 diabetes, the risks of complications are reduced if you control blood sugar."—*Annie Stuart*

1 The DCCT/EDIC Research Group. *N Engl J Med.* 2015; 372(18):1722-1733.

Relevant financial disclosures:
Dr. Aiello—*None.*

Phaco & Glaucoma Control

Panel Advises Fewer Combined Procedures

Phacoemulsification and IOL implantation alone—without concurrent glaucoma surgery—appears to be a reasonable and safe surgical option for certain glaucoma patients whose disease is well controlled with 1 or 2 medications.

According to a recent Academy *Ophthalmic Technology Assessment (OTA),* the available published evidence supports the phaco-only approach for well-controlled cases of primary open-angle glaucoma (POAG), including normal-tension cases (NTG), pseudoexfoliation glaucoma (PXG), and primary angle-closure glaucoma (PACG).[1]

"You don't have to see every patient who comes to you with both a cataract and glaucoma as a candidate for combined surgery," said coauthor Philip P. Chen, MD. "From the evidence that we have, for people who are not poorly controlled, for people who are not on a maximum medications, doing the cataract surgery alone is a reasonable option. It's quite safe." Dr. Chen is professor and Grace E. Hill Chair in Vision Research at the University of Washington, in Seattle, and chief of ophthalmology at the UW Medicine Eye Institute.

Phaco effects. The *OTA* panel found that when IOP was under good medical control before phaco:

- Postop decreases in mean IOP were "small" and "moderate" in POAG and PXG eyes (–13% and –20%, respectively) and "substantial" (–30%) in PACG eyes.
- On average, medication use after the cataract surgery fell by 12% in POAG eyes, 35% in PXG, and 58% in PACG. (The latter group included eyes that were poorly controlled before phaco.)
- Pre-phaco IOP was the factor that most consistently influenced the amount of IOP reduction; the higher the IOP, the greater the IOP reduction.
- Worse IOP control after phaco was reported in up to 14% to 26% of patients, but few patients subsequently required filtration surgery (0%-4%) 1 to 5 years after cataract surgery.
- An early IOP spike occurred in some patients (median, 8%-21%, depending on the glaucoma type), but it was transient and usually manageable with medication.

Limitations. The panel's review encompassed the best available knowledge through late 2014, but the process also highlighted gaps and limitations in the evidence, Dr. Chen said.

"One problem for us was that we had relatively few studies to draw upon because combined phaco and glaucoma surgery has typically been considered the standard of care. In addition, a lot of the papers were retrospective, were not well controlled, and had methodological problems," Dr. Chen said. "We certainly could use better quality evidence in this area."

Safety of phaco alone. Despite the limitations, the *OTA* panel found sufficient evidence to identify POAG (including NTG), PXG, and PACG as the glaucoma patient groups that can be routinely spared from combined phaco/filtration procedures, Dr. Chen said. These constitute the majority of glaucoma patients that ophthalmologists generally encounter, he said.

"I think that the average ophthalmologist can be assured that for the vast majority of their patients with one of these types of glaucoma, which is controlled on 1 or 2 medications, doing cataract surgery alone will not be dangerous for the patient," Dr. Chen said. "It's safe to do the cataract surgery alone." —*Linda Roach*

1 Chen PP et al. *Ophthalmology.* 2015;122(7):1294-1307.

Relevant financial disclosures:
Dr. Chen—*None.*

Retina Report

Laser, Higher Drug Dose Add No Benefit in RVO Tx

CRVO. The RELATE trial compared treatment options for patients with BRVO or CRVO, like the case shown here.

The best way to sum up the RELATE Trial?[1] More isn't better.

The trial researched 2 key questions. First, does a higher dosage of ranibizumab improve outcomes in chronic or recurrent edema from retinal vein occlusion (RVO)? To answer that question, patients were randomized to receive ranibizumab injections of 0.5 or 2 mg every 4 weeks for 24 weeks.

The patients were then re-randomized to compare pro re nata (PRN) ranibizumab plus scatter photocoagulation versus PRN ranibizumab alone to investigate the second question: Does treating the peripheral retina with scatter photocoagulation improve long-term outcomes and reduce treatment burden?

Unequivocal results. The study provided unequivocal answers to these 2 questions, said lead author Peter A. Campochiaro, MD, at the Wilmer Eye Institute.

1) Although there was a greater reduction of edema in patients with central (but not branch) RVO treated with the higher dose of ranibizumab over 6 months, the improvement in BCVA was similar between both dosage groups. 2) After 2.5 more years of follow-up, the researchers found that adding laser therapy to ranibizumab did not produce any clinically significant benefit in visual outcomes, edema resolution, or reduction in PRN injections.

Other potential approaches. The researchers did not study whether giving scatter photocoagulation therapy early in the disease would be beneficial. Dr. Campochiaro said that pursuing this would prove unproductive, in part because laser caused temporary exacerbation of macular edema and reductions in vision.

"It's best to turn our attention to modes of sustained delivery of anti-VEGF therapy and steroids in appropriate patients," he concluded. —*Annie Stuart*

1 Campochiaro PA et al. *Ophthalmology.* 2015;122(7):1426-1437.

Relevant financial disclosures:
Dr. Campochiaro—*Aerpio Therapeutics: C; Alimera: C; Allergan: S; Genentech: S; Regeneron: S.*

Visual Acuity via Smartphone

Accuracy of Snellen Apps

Just how accurate are inexpensive smartphone apps at measuring Snellen VA? They might be close enough to use in a pinch—but only if the optotypes are the correct size, Australian ophthalmologists report.[1]

When they tested 88 hospitalized patients with a conventional eye chart and an iPhone 4 app (Snellen, Dr Bloggs Ltd.), the overall mean difference in logMAR VA between the 2 methods was 0.02 logMAR. But when patients were stratified by VA, the mean difference was greatest in the 6/18 or worse group: 0.276 logMAR, about 2 Snellen lines. The authors noted that the small size of this group limits the interpretation of the data.

"For clinicians seeing patients in hospital, a smartphone visual acuity chart is a reasonable tool to assess visual acuity, if you don't have access to anything else," said coauthor Chandrashan Perera, MBBS, an ophthalmology resident at Fremantle Hospital, in Western Australia. "The main thing is to realize that there is a lot of variability among these apps."

The researchers downloaded 11 free or 99-cent iTunes apps for the study, but only 3, including the Snellen app discussed above, had onscreen optotypes within 10% of the correct size for each line. The other 8 apps had optotypes that the study calculated were inaccurate by 11.9% to 39.9%.

Such variance suggests a need for caution with patients referred by a non-ophthalmologist who might have used a smartphone to check VA, said Dr. Perera. "It's important not to expect the referral visual acuity to be especially accurate. You don't know which app they're using, and how accurate it was."

This study tested apps from 2012. Since then, more Snellen apps have appeared, including at least 1 that reportedly overcomes such problems.[2] —*Linda Roach*

1 Perera C et al. *Eye* (Lond). 2015 May 1. [Epub ahead of print].
2 Gounder PA, et al. www.journalmtm.com/category/articles/original-article/page/2/.

Relevant financial disclosures:
Dr. Perera—*None.*

PETER A. CAMPOCHIARO, MD

For the financial disclosure key, *see page 8.* ***For full disclosures,*** *including category descriptions, view this News in Review at www.eyenet.org.*