

# News in Review

COMMENTARY AND PERSPECTIVE

## RETINA

### Inflammation Risk of Brolucizumab in AMD Treatment

**AFTER FDA APPROVAL OF THE ANTI-VEGF drug brolucizumab (Beovu) in 2019, for the treatment of wet age-related macular degeneration (AMD), reports surfaced of intraocular inflammation (IOI) among patients prescribed the medication. To learn more, researchers in France examined the risk of IOI following the treatment with the drug. Their study showed an IOI incidence rate of 10.5% with brolucizumab use, highlighting the need for monitoring and education.<sup>1</sup>**

**Study details.** For the study, a team at the Sorbonne University in Paris and several other academic medical centers in France, collaborated with Beovu-maker Novartis on a prospective phase 3b single-arm, open-label, multicenter study. They followed two sets of patients being treated with brolucizumab for AMD. One group had been previously treated with ranibizumab or aflibercept, while the other set had never received anti-VEGF treatment.

**Findings.** In total, 505 patients were treated with brolucizumab. Of these, 53 had at least one IOI-related event, an incidence of 10.5%. The majority of these cases (81%) occurred during the loading phase, or first three months of treatment. The most frequently reported symptoms included floaters, blurred vision, and decreased vision.

Once IOI was identified, the affected



**AFTER BROLUCIZUMAB.** Color fundus photograph shows perivascular sheathing and retinal whitening.

patients promptly stopped receiving brolucizumab therapy. Most were treated with corticosteroids—28.3% were given systemic steroids and 26.8% were given intraocular steroids—which completely resolved the inflammation for most patients. Two patients experienced severe vision loss related to retinal complications. The researchers noted no difference in the rate of adverse effects between patients who had been previously treated with anti-VEGFs and those who had never been treated. The researchers said: “Given the higher drying effect and longer treatment duration with brolucizumab, the risk-benefit ratio remains favorable, as long as ophthalmologists observe the precautions for use from the prescribing notice.”

**A caution.** But retina specialist Gregg T. Kokame, MD, at the University of Hawaii, Honolulu, who was not involved in the study, said he has concerns. “Brolucizumab has a better response than aflibercept in the drying effect of subretinal fluid and macular edema, but the risk of inflammation limits its use,” he said. “The risk of severe vision loss, although very rare, does

affect the decision on whether or not to use brolucizumab.” He noted that although the majority of IOI cases occurred during the loading phase, “inflammation can occur much later and as long as two months after the last injection.” Dr. Kokame and the researchers emphasized the importance of both physician and patient monitoring for IOI when using brolucizumab.

Ophthalmologists should “educate patients carefully on the symptoms of inflammation, for example, redness, pain, floaters, photophobia, and decreased vision,” Dr. Kokame said, adding that patients should be evaluated by an ophthalmologist immediately if symptoms develop. Because most inflammation cases occurred after the first three brolucizumab injections, he said, “Be especially vigilant about exams for inflammation and patient symptoms during this time.”

Dr. Kokame noted that while the treatment of wet AMD “has markedly advanced” with anti-VEGF agents, the financial costs and frequent office visits are a tremendous burden on patients and the health care system. “Any treatment that can successfully extend the duration of treatment while still maintaining efficacy is the most important future goal,” he said, pointing to current studies looking at the potential for gene therapy that involves intravitreal, subretinal, and suprachoroidal methods of administration. —Ashley Welch

<sup>1</sup> Bodaghi B et al. *Ophthalmol Retina*. Published online June 19, 2023.

Relevant financial disclosures: Dr. Kokame—None.

## New App for Navigating Subway Stations

**OLDER SUBWAY STATIONS THAT** were never designed with accessibility in mind can be dangerous for people with visual impairment as they try to traverse winding corridors, a myriad of gates and turnstiles, and overcrowded platforms. A new mobile phone app, Commute Booster, may help fill some accessibility gaps, making city

subway stations safer and easier to use, according to researchers at New York University (NYU) Tandon School of Engineering and NYU Grossman School of Medicine.<sup>1</sup>

**Integrated technologies.** The app took about two years for the team to develop, and it works by reading signage that a traveler may encounter in transit stations. It integrates two types of technology—general transit feed specification (GTFS) and optical character recognition (OCR). The GTFS dataset generates a comprehensive list of wayfinding signage within subway stations, and the OCR technol-

ogy helps users understand relevant navigation signage in their immediate surroundings. A person can use their smartphone camera to snap a photo of signs in stations. Then, in real time, the app weeds out information that is irrelevant—for example, culling out signage telling people to go to a comedy show—and provides only official transit markers, said study author John-Ross Rizzo, MD.

The researchers tested Commute Booster in three New York City subway stations—Jay Street-MetroTech, DeKalb Avenue, and Canal Street. New York City’s subway system has more than 472

## GLAUCOMA

## Frontloading SITA-Faster

**PERFORMING TWO VISUAL FIELD (VF) TESTS USING** SITA-Faster during one appointment can yield more valuable VF data than standard testing, report researchers at the University of New South Wales, in Sydney, Australia.<sup>1</sup>

Tracking glaucoma progression is challenging but critical to identifying and following patients with glaucoma. “Because VF testing is time-consuming, most patients only receive one VF test per year, even though more tests are required to detect progression,” said study author Jeremy C.K. Tan, MD, FRANZCO.

**Approach.** To examine the feasibility of obtaining more VF data during a single visit, the researchers used SITA-Faster to analyze 902 eyes in 463 individuals who had either normal vision or suspected glaucoma, or who had manifest glaucoma. The mean age was 63.6 years, and the majority of participants were male. Each eye underwent two VF tests at an initial appointment and then two more tests at a follow-up visit, where the mean interval was 265 days between the two sets of tests.

**High speed and reliability.** Performing two VF tests per eye on the same visit—referred to as “frontloading”—produced sets of repeatable perimetric data with significant improvement of reliability indices from the first to second test, the authors reported.

Using SITA-Faster also saved time. The mean duration of each SITA-Faster test was 132.6 seconds, which is approximately half of the duration of a single SITA-standard test, and about two-thirds the time of a SITA-Fast test.<sup>2</sup>

“Our findings suggest that performing two VF tests on the same eye at the same visit is a feasible way to obtain more VF data,” said Dr. Tan, explaining that the shorter test duration of SITA-Faster may help

increase testing frequency at minimal time cost to meet recommended guidelines.<sup>3</sup>

**A surprising finding.** Frontloading also led to fewer false positives in the second test. This indicated improved performance from the first to the second test, said the authors. “This is contrary to concerns that the second test result will be of lower quality due to patient fatigue,” said Dr. Tan.

**Generalizability.** The study population comprised mostly patients who were healthy or had early glaucoma, which may not be representative of patients visiting eye clinics. However, Dr. Tan noted that his team is pursuing additional studies involving participants with more advanced glaucoma.

**Practical tips.** Jithin Yohannan, MD, MPH, at the Wilmer Eye Institute at Johns Hopkins University School of Medicine, who was not involved in the study, said that although test duration is shorter with SITA-Faster, the testing conditions may remain demanding on the patient. “Some patients just don’t do well with SITA-Faster. Although shorter in duration [than other VF tests], it may be too difficult for some,” Dr. Yohannan said.

According to Dr. Tan, providing a few minutes of rest between tests may help decrease the potential for fatigue. He also encourages clinicians to explain the rationale of frontloading to clinical staff and patients before implementation. “Frontloading does not have to be performed on all patients at all visits,” he said, because frontloading may be more beneficial for baseline evaluation of new patients inexperienced with VF testing and with the assessment of patients prone to test variability.

—Christos Evangelou, PhD

1 Tan JCK et al. *Ophthalmol Glaucoma*. Published online March 21, 2023.

2 [aao.org/sita](http://aao.org/sita). Accessed Sept. 14, 2023.

3 Gedde SJ et al. *Ophthalmology*. 2021;128:71-150.

**Relevant financial disclosures:** Dr. Tan—None. Dr. Yohannan—None.

stations—it is a confusing “interconnected web of edges and nodes,” said Dr. Rizzo, so it’s an ideal place for testing the application. The app was 97% accurate in identifying signs needed to reach a traveler’s intended destination.

**Independent navigation.** When asked whether this kind of tech would be helpful, Janet S. Sunness, MD, of the Hoover Low Vision Rehabilitation Services at the Greater Baltimore Medical Center, responded that it “would make access much easier.” Dr. Sunness, who is not affiliated with Dr. Rizzo’s research, added that the use of GTFS offers an easy way to leverage data that transportation systems make available to third parties and that an app like this could be readily adopted because it “does not require costly modifications to the subway station itself.”

Without the app, Dr. Sunness said, “Even if patients find the subway station using GPS or by other means, there is nothing to help them within the subway station itself. Low vision and blind patients are only able to use the subway system independently if they are already familiar with the configuration of a particular station.”

**Travel equity.** For Dr. Rizzo, the issue is personal. He lives with choroideremia, a rare condition that causes progressive vision loss. He hopes that the app will eventually be usable around the world, in any city that uses GTFS, to support more travel equity. “I think it’s unfortunate, but the reality is transportation is really difficult [for those with visual impairment]. It’s largely inaccessible.”

Dr. Rizzo said his team is planning to launch clinical trials—pending institutional review board approval—with test participants in New York City. The Lighthouse Guild, a nonprofit vision and health care organization, plans to collaborate on the trial, as well. He said he and his team are also actively working on adapting the app, currently available only in English, to other languages.

Unless transportation barriers are addressed, there will be a perpetual cycle of disparities, Dr. Rizzo said. “As



**ACCESSIBLE TRAVEL.** A new mobile app aims to make navigating labyrinthine subway platforms easier and safer for people with low vision.

a blind guy, my hope is [that the app] helps keep people safe and allows for more efficient travel.”

—Brian Mastroianni

1 Feng J et al. *IEEE J Transl Eng Health Med*. Published online July 7, 2023.

**Relevant financial disclosures:** Dr. Rizzo—None. Dr. Sunness—None.

## COMPREHENSIVE

# Eye Injuries Represent Significant Global Burden

**UNTIL NOW, NO STUDIES HAVE SYSTEMATICALLY** measured the incidence and burden of eye injury globally, encompassing all countries and ages, and looking at all causes of injury. Using data from the Global Burden of Disease Study 2019, as well as data from systematic reviews of injury incidence for all causes of injury—including eye injuries from foreign objects, explosives, road traffic, mechanical or nonmechanical (e.g., chemical, thermal, radiation) sources, and self-inflicted injuries—researchers reported that the incidence and burden of eye injury has been significant over the past three decades at the global, regional, and national levels.<sup>1</sup>

“The occurrence of eye injuries is constantly changing. The causes of those injuries have also changed,” said study coauthor Lei Liu, MD, at the Guangdong Eye Institute in Guangzhou, China. Industrial development puts people at higher risk for eye injury, he explained.

The authors reported that exposure

to mechanical forces, foreign bodies, and falls were the three leading causes of eye injury in 2019. Dr. Liu noted that globally, eye injuries caused by traffic accidents and violent conflicts are gradually increasing, too. “Those are trends we should pay attention to,” he said.

**Retrospective demographic analysis.** The authors analyzed data from 204 reporting countries, including hospital and emergency department records, insurance claims, and surveys collected from 1990 to 2019. ICD-9 and ICD-10 codes were used to describe and categorize injuries, morbidity, and the reason for an eye injury. Disease modeling—meta regression, a Bayesian meta-regression framework, was applied to incorporate multiple outcome measures into one model in order to estimate years of life that a patient lived with a disability due to eye injury.

**Trends of disease burden.** The number of incident cases of eye injury increased by 24%, from 48,220,830 in 1990 to 59,933,290 in 2019. “Eye injury is one of the most significantly disabling injuries, with a large number of cases in 2019 compared with 1990,” the authors wrote. Eye injuries were especially high in Australasia, with males having higher incidence than females across the 30-year study period. There was not a significant increase in years of life lived with disability in any region. Young and middle-aged individuals (ages 24 to 49 years) were more likely to sustain eye injuries compared with older people.

**A public health imperative.** Eye injury is a leading cause of blindness and disability globally, and it represents a significant economic burden, especially for low- and middle-income countries, the authors wrote. Dr. Liu said factors influencing incidence, distribution of illness, and specific causes of eye injury are complex and vary across regions and individual nations, requiring tailored injury prevention education.

—Julie Monroe, MSN, RN

1 Cong L et al. *eClinicalMedicine*. Published online Aug. 9, 2023.

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

See the financial disclosure key, page 10. For full disclosures, including category descriptions, view this News in Review at [aao.org/eyenet](http://aao.org/eyenet).