

The Literature

BY GEOFFREY T. EMERICK, MD

DEVELOPMENT AND VALIDATION OF A PREDICTIVE MODEL FOR NONADHERENCE WITH ONCE-DAILY GLAUCOMA MEDICATIONS

Chang DS, Friedman DS, Frazier T, et al¹

ABSTRACT SUMMARY

Chang and colleagues developed a predictive model for nonadherence from the Travatan Dosing Aid (TDA) study (n = 196).^{2,3} They assessed the model's performance using a separate group of patients from the Automated Dosing Reminder Study (ADRS; n = 407). They also developed a scoring system to simplify the estimation of risk for clinical use and electronically monitored the dosing of eye drops for 3 months in both studies. Adherence was calculated as the percentage of days on which a dose was taken within 4 hours of the average dosing time specific to each patient. Nonadherence was defined as a patient's taking 75% or less of the prescribed doses.

According to the investigators, six factors were associated with nonadherence: younger age (under 50 years), black race, worse self-reported health, shorter duration of glaucoma medical therapy (< 10 years), lower self-reported adherence ($\leq 95\%$), and admission of not following doctors' orders. Chang et al found that the risk scoring system developed from the TDA study performed well and had good discrimination (area under the receiver-operating characteristic curve of 0.80) and calibration (Hosmer-Lemeshow goodness-of-fit test, $P = .102$) when it was applied to the ADRS population.

DISCUSSION

Adherence to an agreed-upon treatment plan is critical to the successful management of chronic conditions such as glaucoma. Previous studies have shown a direct association between poor adherence and worse visual outcomes.⁴ Unfortunately, physicians are not skilled at determining who is nonadherent. Patients at the highest risk for nonadherence would benefit from educational videos, a review of the barriers to using eye drops, and telephone reminders.

Chang and colleagues provide a scoring system for

identifying the patients most at risk for nonadherence. For example, based on the six factors identified as associated with nonadherence, a 48-year-old black woman in "good" health who has been taking glaucoma eye drops for the past 2 years but who admits to missing doses has about a 75% probability of being nonadherent. The scoring system would be especially useful as an online calculator or incorporated into an electronic health records system.

GLAUCOMA SEVERITY AND MEDICATION ADHERENCE IN A COUNTY HOSPITAL POPULATION

Ung C, Zhang E, Alfaro T, et al⁵

ABSTRACT SUMMARY

Ung et al assessed the association between disease severity and adherence to glaucoma medications in a county hospital setting. The study included 126 patients from the San Francisco General Hospital Ophthalmology Clinic. Based on an oral questionnaire, the investigators assessed patients' demographic information, their knowledge of glaucoma, and their perceptions about adherence to glaucoma medications. The severity of glaucoma was evaluated, and medication adherence was measured using pharmacy refill data and by calculating the medication possession ratio (the ratio of total days' supply of medication to the actual number of days). Ung and colleagues measured adherence retrospectively over the 18-month period leading up to a patient's entry into the study. Those with a medication possession ratio greater than 80% were considered adherent.

According to the study, patients with severe glaucoma were more likely to adhere to prescribed therapy than those with mild or moderate glaucoma (adjusted odds ratio, 1.54). Age, gender, race, level of education, years of glaucoma, number of medications, and glaucoma diagnosis were not found to be statistically significantly associated with adherence.

DISCUSSION

These findings contradict those of Sleath et al, who found that nonadherent patients were more likely to

“Poor follow-up may contribute to the worsening of glaucoma. It will be ... important to determine through longitudinal studies whether improved follow-up enhances outcomes.”

have greater visual field loss.⁴ In the current study, those with mild glaucoma were more likely to be nonadherent. The differences may be due to the studies' populations and/or methodologies. In the study by Ung et al, only 39% of those with mild or moderate glaucoma were adherent, and only 59% of those with severe glaucoma were adherent. Sleath et al studied primarily white patients from a private practice with 89% overall adherence. Ung and colleagues recognized and discussed these differences in their study, attributing the better adherence of those with more severe glaucoma to a greater awareness of the disease and its effect on vision. According to the authors, “it is far more likely that greater disease severity results in better adherence, rather than greater adherence resulting in more severe disease. ... It can be postulated that those with mild glaucoma commonly do not fully understand the severity of vision loss that can occur.”

These findings do not weaken the strong evidence that better adherence leads to better IOP control, which in turn reduces the chance of visual field progression. Rather, the results of the current study reaffirm the importance of educating patients about glaucoma and its pathophysiology, particularly in its mild to moderate stages when patients may be asymptomatic.

THE ASSOCIATION BETWEEN COMPLIANCE WITH RECOMMENDED FOLLOW-UP AND GLAUCOMATOUS DISEASE SEVERITY IN A COUNTY HOSPITAL POPULATION

Ung C, Murakami Y, Zhang E, et al⁶

ABSTRACT SUMMARY

In a cross-sectional study, Ung et al investigated the association between insufficient follow-up and clinical parameters such as disease severity and medication use among 206 patients at San Francisco General Hospital. Subjects were classified based on their compliance with recommended follow-up examination intervals over the preceding year. The investigators determined glaucoma severity based on the American Academy of

Ophthalmology Preferred Practice Pattern guidelines.⁷

After an adjustment for the impact of potential confounding variables, patients with severe glaucomatous disease were less adherent to the recommended follow-up schedule compared with patients with mild or moderate glaucomatous disease (adjusted odds ratio, 1.89).

The authors concluded that people with poor follow-up adherence were significantly more likely to have severe glaucomatous disease, suggesting that poor follow-up may contribute to the worsening of the disease or, alternatively, that those with more severe disease are less inclined to follow up at suggested intervals.

DISCUSSION

This study addresses the relationship between adherence and scheduled follow-up appointments. Experience tells us that these are closely connected. Ung et al provide useful insights into the connection between glaucoma severity and regular follow-up, with the take-home message that poor follow-up may contribute to the worsening of glaucoma. It will be more difficult but important to determine through longitudinal studies whether improved follow-up enhances outcomes. Steps that can be taken now in our practices include implementing a system of telephone appointment reminders and follow-up phone calls for “no-show” patients. ■

Section Editor James C. Tsai, MD, is the Robert R. Young professor of ophthalmology and visual science and the chair of the Department of Ophthalmology & Visual Science at Yale School of Medicine in New Haven, Connecticut. Dr. Tsai may be reached at (203) 785-2020; james.tsai@yale.edu.

Geoffrey T. Emerick, MD, is an assistant professor of clinical ophthalmology in the Department of Ophthalmology & Visual Science at Yale School of Medicine in New Haven, Connecticut. Dr. Emerick may be reached at gtemerick@gmail.com.



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