Personalized Glaucoma Care

The etiology of glaucoma is widely believed to be multifactorial in nature. Although clinicians' understanding and management of glaucoma have improved dramatically over the years, the precise role of IOP-independent risk factors in patients' development of the disease remains enigmatic.

At present, many clinicians view glaucoma as a predominantly IOP-related ophthalmic disease. IOP is certainly the main treatable risk factor today, but I anticipate a much more personalized approach to glaucoma risk assessment and treatment in the not-too-distant future. Moreover, I suspect that practitioners will take a far more holistic approach. Medical histories will become more detailed, and they will focus on identifying emerging glaucoma risk factors and associated diseases. Electronic health records will implement robust glaucoma risk calculators that will help physicians detect the disease and its progression as well as make therapeutic decisions. Blood tests may become a routine part of the glaucoma patient workup. By measuring antioxidant and hormone levels, blood tests may help clinicians to identify biomarkers of glaucoma and to assess genetic risk factors that could affect the disease. Vascular measurements of ocular perfusion pressure as well as retrobulbar, retinal, and choroidal blood flow appear to be predictive of glaucomatous progression. Corneal hysteresis measurements may not only identify patients at risk of developing the disease but also help practitioners to assess the efficacy of treatment.

Currently, glaucoma therapy consists almost exclusively of lowering IOP with topical medication, laser ablation, or incisional surgery. Researchers, however, are working to develop novel methods of treating glaucoma as a neurodegenerative disease. In experimental models, N-methyl-D-aspartate receptor antagonists, brain-derived neurotrophic growth factors, and antiapoptotic agents appear to promote the survival of retinal ganglion cells. Diet and nutritional supplements may become an important part of preventing retinal ganglion cell death. Physicians may one day recommend immunomodulation and vaccinations for certain patients. Improved management of systemic diseases associated with glaucoma may be entertained in certain circumstances. Gene and stem cell therapies may prove to be beneficial in glaucoma management as well. Perhaps investigators will develop neuroregenerative therapies that will reverse the course of glaucoma and restore visual function.

Contributors to this special edition of *Glaucoma Today* describe modern thinking beyond IOP. I am encouraged by the progress made in recent years, and I look forward to a day when I can predict the course of glaucoma and selectively target pathology in individual patients. ■

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