

LIFESTYLE

MODIFICATIONS



Patients often ask, "Is there anything else I can do?"

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Many patients with glaucoma want to know that they are doing everything possible—even beyond their medical and surgical glaucoma treatments—to avoid progressive vision loss. As lifestyle modifications in diet and exercise have been shown to offer benefits for systemic diseases such as diabetes and hypertension, ophthalmologists are increasingly facing lifestyle-related inquiries from their patients. Currently, identified primary open-angle glaucoma genes account for less than 5% of cases in the general population,¹ lending credence to the idea that environmental factors likely play a significant role in the disease.

Because measuring the effect of lifestyle factors is difficult for a variety of reasons, few modifications are likely to have a significant impact on glaucoma. However, this article identifies multiple lifestyle areas with potential roles in disease that can be addressed when counseling patients.



SLEEP

IOP is higher at night while patients are asleep and in a

supine position.² While in the lateral position, the dependent eye has been shown to have a significant increase in IOP compared with the nondependent eye.³ Sleeping in a face-down position has also been shown to increase IOP by approximately 2.5 mm Hg, potentially via mechanical forces created by the pillow on the eye.⁴ Patients can be advised to consider head-of-bed elevation and to avoid sleeping on the side of the more severely affected eye, especially in cases of highly asymmetric disease.



EXERCISE

Aerobic exercise has been shown to acutely lower IOP proportional to exercise intensity by up to 4.7 mm Hg.⁵ Although IOP reduction after intense exercise is short-lived, sedentary individuals who achieve some degree of physical fitness can have sustained IOP reduction that persists for several weeks after exercise cessation.⁶ Weightlifting may increase IOP modestly during workouts through a Valsalva maneuver mechanism, followed by a nominal decrease.⁷ The clinical significance of this elevation is unclear, and, as a

form of exercise, weightlifting may still have long-term benefits.

Yoga has become increasingly popular, and its practice often involves various head-down positions that can potentially double IOP after a few minutes.⁸ As such, patients should be counseled to avoid maintaining these positions for sustained periods of time, especially those with progressive or advanced disease.



DIET AND SUPPLEMENTS

Recommendations on diet are difficult due to reliance on self-reporting and lack of prospective studies available. Oxidative damage to the trabecular meshwork and free radical reactions with retinal ganglion cells are mechanisms that may suggest a beneficial role of antioxidants in glaucoma. However, in the only prospective study available, no significant relationship between glaucoma and intake of carotenoids, vitamin C, and vitamin E was found.⁹

Consumption of omega-3 and omega-6 fatty acids has been the focus of several glaucoma studies with mixed outcomes. One study found an increased risk of glaucoma

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with a high ratio of omega-3 to omega-6 fatty acids,¹⁰ whereas a 2018 cross-sectional study of 3,865 patients found lower glaucoma risk in those who consumed increased amounts of omega-3 fatty acids.¹¹ The same study found increased glaucoma risk among patients in the higher quartiles of total polyunsaturated fatty acid consumption. Although additional studies are needed, it may be reasonable to encourage patients to consume foods high in omega-3 fatty acids and to limit their total consumption of polyunsaturated fatty acids.

Caffeine is known to elevate IOP by approximately 1 mm Hg for at least 90 minutes after consumption.¹² A large, prospective, population-based sample of health professionals demonstrated a 1.6-fold increased risk of primary open-angle glaucoma in those who consumed five or more cups of caffein-

ated coffee per day.¹³ Although small to moderate amounts of caffeine are reasonable in most patients, it is advisable to discourage heavy consumption.

Ginkgo biloba extract (GBE) has shown potential neuroprotective and blood flow effects.¹⁴ These mechanisms have been found to be independent of IOP reduction. One study even found an improvement in preexisting visual field damage in patients with normal-tension glaucoma after 4 weeks of GBE supplementation.¹⁵ Although larger clinical trials are needed, GBE supplementation may be suggested, particularly when IOP-independent mechanisms such as vascular dysfunction are suspected to be contributory to progressive disease.



MARIJUANA

With increasing legalization, marijuana is

one of the most commonly discussed alternative glaucoma therapies. Although systemic consumption by inhalation is known to lower IOP, marijuana's short duration of action (3–4 hours) and side effect profile make long-term therapy unreasonable.¹⁶ As mentioned above, there is a growing body of evidence that vascular dysfunction may be contributory to glaucomatous damage, and the systemic blood pressure-lowering effect may compromise ocular perfusion to an extent, thereby negating any potential benefit of reduced IOP.



**MEDICAL
COMORBIDITIES**

Asking patients about antihypertensive medication dosing in the evening and sleep apnea may also illuminate areas to consider in managing their glaucoma. A recent study found that a 10-mm Hg drop in mean arterial pressure during sleep was predictive of visual field progression in patients with normal-tension glaucoma.¹⁷ The study authors suggest that nocturnal blood pressure be considered a modifiable risk factor in these patients.

Encouraging patients to check their blood pressure in the evening or performing ambulatory monitoring can ensure adequate overnight perfusion. Avoiding nocturnal dosing of hypertension medications and considering salt supplementation may also be advisable, although the effects of such approaches are currently unknown.

The link between sleep apnea and glaucoma has been studied but remains unclear. Early reports found that untreated sleep apnea carries an increased risk of glaucoma development and progression.¹⁸ However, more recent studies have failed to show a relationship between sleep apnea and progression of glaucoma. Nonetheless, given the systemic comorbidity and mortality risk of untreated sleep apnea, any patient with daytime fatigue or snoring

AT A GLANCE

- ▶ Primary open-angle glaucoma genes account for less than 5% of cases in the general population, lending credence to the idea that environmental factors play a significant role.
- ▶ Measuring the effects of lifestyle factors on glaucoma is difficult, but certain modifications may prove beneficial for some patients.
- ▶ Adjustments in sleep, exercise, and diet can be suggested to patients seeking additional measures by which to improve their eye health.

during sleep would likely benefit from a sleep study evaluation.

CONCLUSION

It is challenging to quantify the effects of lifestyle factors on glaucoma. However, for patients seeking measures outside their medical or surgical glaucoma interventions, several modifications are certainly worth discussing. ■

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