

Complementary and Alternative Medicine for Glaucoma

A review of the literature.

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Given the recent popularity of complementary and alternative medicine, some patients may seek these treatments to supplement their traditional glaucoma therapy. We reviewed the literature to investigate the potential role of complementary and alternative medicine for this disease.

EPIDEMIOLOGY

Approximately 72 million adults in the US used some form of complementary and alternative medicine between 1997 and 2002.¹ The prevalence of its use specifically for glaucoma—including herbal remedies, acupuncture, homeopathy, faith healing, meditation, megavitamin therapy, therapeutic touch, exercise, and dietary modification—is approximately 5%.²

MEGAVITAMIN THERAPY

Vitamins fulfill essential metabolic roles throughout the body. Vitamin deficiencies have not been shown to contribute to glaucoma in humans.³ An analysis of data from the Nurses' Health Study and Health Professionals Follow-up Study found no statistically significant association between the consumption of dietary antioxidants and the risk of primary open-angle glaucoma.⁴ With the exception of the serum osmolarity-altering effect of high-dose intravenous ascorbic acid for acute angle-closure glaucoma,⁵ megadoses of vitamins do not benefit patients with glaucoma.³ At present, there is no scientific evidence for recommending megadose vitamin supplements for glaucoma.³

HERBAL REMEDIES

Many valuable medications have been derived from plants. Commercial herbal preparations, however, contain a nonstandard mixture of many active and inactive com-

pounds. By ingesting herbal preparations, one may hope to gain an unrecognized, biologically beneficial compound.

Bilberry

Current evidence does not support the claim that bilberry improves night vision or contrast sensitivity.^{6,7} We were unable to identify any studies alluding to an effect on IOP or the visual field.³

Chinese Herbs

In animals, many Chinese herbal products improve retinal and choroidal circulation⁸⁻¹⁰ and facilitate retinal recovery after ischemic insult.^{11,12} The effects on human glaucoma, however, are unknown.³ No severe adverse effects have been reported for Chinese herbal preparations that have been tested for ocular blood flow.³

Marijuana (Cannabis)

Inhaled marijuana lowers the IOP by an average of 25%¹³ in 60% to 65% of people.¹⁴ In one patient, the mechanism was through increased uveoscleral outflow.¹⁵ Cannabinoids may also have neuroprotective and vasorelaxant properties.¹⁶ Although marijuana's significant systemic toxicity and short half-life of 3 to 4 hours¹³ make it a poor treatment option, newer topical cannabinoids have shown promise in animal and human studies.¹⁶

Ginkgo (Ginkgo Biloba)

Ginkgo has potent antioxidant, antiapoptotic, and cytoprotective properties,^{3,17} and it demonstrated anti-cataract action in a murine model.¹⁷ Ginkgo extract mildly increased blood flow through the ophthalmic artery in normal subjects ($n = 11$),¹⁸ but its clinical relevance in glaucoma is unclear.¹⁹

A recent, prospective, randomized, placebo-controlled, double-blind crossover trial ($n = 27$) showed a statistically significant improvement in visual fields in patients with normal-tension glaucoma after 4 weeks of treatment with ginkgo extract.²⁰ The short duration of the study, however, does not provide information on how long ginkgo's effects will last or if the findings were simply long-term fluctuation artifacts. It is also unclear how much ginkgo's ability to improve cognitive functioning in some patients may have contributed to the improved performance on visual field tests in the intervention group.²¹ Further investigation that takes into account the effects of ginkgo on the visual field, optic nerve characteristics, and ocular blood flow is warranted.²⁰ Clinicians should note that, due to ginkgo's antiplatelet activity, it is recommended that the extract be avoided in patients on anticoagulant therapy.^{22,23}

To summarize, although some herbal preparations show promise for the treatment of glaucoma, there is no definitive evidence for their use at this time. More comprehensive reviews have been examined that discuss additional herbal remedies as well.^{3,14,24,25}

DIET

Food contains nutrients important in the causation, prevention, and amelioration of disease. By altering the type or quantity of food, one may change the balance between beneficial and harmful factors. In mice, a calorie-restricted diet was protective against glaucoma.²⁶ A direct comparison between the body mass indices of patients with and without glaucoma, however, found no statistically significant difference.^{27,28} In fact, the evaluation revealed a trend that was not significant toward *lower* body mass indices in glaucoma patients. Similarly, there is no independent association between the intake of major fats and fat subtypes and the risk of primary open-angle glaucoma.²⁹ Thus, there is no definitive evidence, at this time, that diet or obesity plays a role in the pathogenesis or treatment of glaucoma in humans.

EXERCISE

Regular exercise improves cardiovascular fitness and can lower systemic blood pressure. Because systemic hypertension is often cited as a risk factor for glaucoma,^{30,31} one may hypothesize that regular exercise could modify this risk.

Exercise can cause an immediate elevation and subsequent decline of IOP to below baseline.³²⁻³⁴ In normal eyes, autoregulation during exercise seems to maintain a consistent rate of blood flow to the optic nerve.³² It is unknown whether glaucomatous eyes have similar abilities. Chronic exercise probably contributes to a modest lowering (1 to 2 mm Hg) of IOP³⁵⁻³⁹ in one-third of normal eyes,³⁶ although one study reported as much as a 4-mm Hg lowering effect.⁴⁰

On the other hand, one cautionary report described three young adults with advanced glaucomatous optic neuropathy who had exercise-induced visual loss, possibly due to a vascular steal phenomenon.⁴¹ Despite this hypothetical risk, it appears that regular exercise can be mildly effective in lowering IOP in some people. There are obviously many additional health-related reasons to maintain a regular exercise regimen.

ACUPUNCTURE

Acupuncture is based on the belief that health is determined by a balanced flow of vital life energy (called *qi* or *chi*) present in all living organisms. By inserting fine needles just under the skin at certain points on the body, an acupuncturist attempts to rebalance the flow of energy to treat disease. A study in dogs with experimentally induced glaucoma demonstrated a decrease in IOP following acupuncture.⁴² A study in rats with induced glaucoma claimed to show a neuroprotective effect of electroacupuncture at 2 but not 100 Hz, as measured by multifocal electroretinograms.⁴³ The IOP, however, was not similar between the experimental and control groups prior to the initiation of electroacupuncture.

Two separate case series of 33 and 18 glaucoma patients found that most reported a subjective improvement in central visual acuity after acupuncture,^{44,45} but they experienced no change in IOP^{45,46} or visual field.⁴⁶ These results suggest that either acupuncture may have some effect specifically on macular function or the intervention group may have experienced a psychological effect that was not detectable by the measurement of overall visual function.

Another case series ($n = 11$) found a significant improvement in both IOP and visual acuity after 5 weeks of acupuncture treatment.⁴⁷ The effect seemed to diminish after 4 weeks without treatment. It is unclear, however, whether the improvement was real or simply due to a normal variation in IOP and visual acuity. A randomized, placebo-controlled trial is needed to further study the potential role of acupuncture for glaucoma.

MEDITATION

Meditation attempts to induce a relaxed state, thereby decreasing people's stress and increasing their voluntary control over autonomic functions. This practice could potentially lower systemic blood pressure or IOP or change blood flow to the optic nerve.

There is no evidence that relaxation techniques lower IOP.^{3,48,49} In fact, a large epidemiological study found a negative correlation between stress and IOP.⁵⁰ This finding is consistent with epinephrine's known aqueous suppressant and IOP-lowering action. Aside from a potential psychological benefit, there is no evidence that meditation has a role in the management of glaucoma.

CONCLUSION

Complementary and alternative medicine deserves scientific scrutiny, because patients with glaucoma can experience progressive visual loss even with appropriate medical treatment. Currently, however, there seems to be little evidence to support prescribing complementary and alternative medicine for the treatment of glaucoma. In particular, ginkgo biloba, some Chinese herbs, acupuncture, and regular exercise deserve further study. Moreover, some topical cannabinoids show early pharmacologic promise.

Given that effective glaucoma therapies may exert their effects by mechanisms that are not related to IOP (eg, increased ocular blood flow), future studies of complementary and alternative medicine should not focus exclusively on IOP but should also take perimetric tests and other objective parameters into account. Further study of alternative therapy not only may discover new treatments, but it also may protect our patients from potentially harmful—or at least economically wasteful—explorations. □

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