

## **Glaucoma Management: Do Alternative medicine & non Pharmaceutical approaches have any role to play?**

**Is there anything that we can do OR things which we should avoid to improve the outcome of our disease besides using medications?**

We have been asked this question again and again by nearly all patients and unfortunately there are very few places where patients can find true information. There is hardly any scientific data available but to dismiss without explaining will leave patient search on internet search engine and may get misleading facts. Alternative and complementary therapies (ACT) for glaucoma refer to disease management strategies other than pharmaceutical, laser, or surgical treatments known to lower intra ocular pressure (IOP) (referred to as conventional therapy). One survey documented that 5% of patients use ACT for glaucoma.

Certain lifestyle activities may elevate IOP and there are indications some of these activities could predispose to POAG in subsets of patients. Patients and most of the time glaucoma specialist also rarely look at the issue of lifestyle and glaucoma from this perspective. A person playing high wind musical instruments (Ex Saxophone) can have 2-fold increase in his IOP from baseline level for short duration. While there is no strong evidence that playing these instruments predisposes to glaucoma, it is reasonable to inform a glaucoma patient about this effects who play these instruments of this effect, particularly if the patient is developing progressive disease at seemingly normal IOP. Certain inverted yoga exercises (Like Shirshasana) increases in IOP 2-3 fold from baseline for short duration. We have documented 3-fold increase in IOP during the inverted position in at least 3 of our progressive POAG patients with good 24 hour IOP control. Many glaucoma specialists have anecdotally noted cases of “normal tension glaucoma” in which a careful history revealed frequent performance of inverted position yoga exercises. Observational studies linking inverted yoga exercises and POAG are lacking, however, it is important to inform glaucoma patients about IOP elevations that are associated with inverted posture positions. Caffeine is consumed by a high percentage of the general public. Most of the studies (14-18) with some exception (19-20) demonstrate modest increase of IOP (~2 mmHg) that lasts for about 2 h after use of coffee. Recently, a prospective observational study, reported increased risk for high tension POAG among those with a positive family history of glaucoma. While this finding requires confirmation. However, coffee beans also contain compounds that have anti-oxidative

effects due to their free radical scavenging and metal-chelating activities. Despite much debate on the effects of coffee on glaucoma, its antioxidant potential deserves further research.

Various cross-sectional and prospective studies related to smoking and POAG do not suggest that smoking increases the risk of glaucoma. Smoking is also linked to cataract and age-related macular degeneration. Overall, cigarette smoking increases the risk of loss of vision so all physicians should encourage people to quit smoking and we are not even talking about increase in several life-threatening diseases including lung cancer.

Alcohol consumption causes a dose related reduction in IOP that can last several hours through temporary osmotic effect. Several other studies have reported no association. Consuming one alcoholic drink per day may have some cardiovascular benefits with keeping the risk of gastroenterology system in mind. Thus, it is important to discourage the notion that drinking alcohol will reduce the risk of glaucoma as the existing evidence is weak. Definitely we don't want people to initiate drinking at the age of 60 to prevent "blindness" and get Cirrhosis.

Patients with glaucoma will frequently ask whether aerobic exercise is "good for glaucoma." There is strong evidence that aerobic exercise lowers IOP. Isometric exercise like lifting weights may produce a small IOP increase during exertion that is followed by a modest decline in IOP. Currently there are no cohort studies that have evaluated the relation between exercise and glaucoma. However, moderate aerobic exercise has many health benefits and should be encouraged. The question arises about increase in IOP in pigmentary glaucoma patients after exercise, but the literature suggests that may not be the case. However if isolated patient report symptoms consistent in increase IOP, we may verify the increase in IOP and advice him against heavy exercise.

There is considerable interest in dietary antioxidants (Ex Red wine, Dark Chocolate, Coca, Green Tea, Glutathione ET cetera) because oxidative stress may induce damage to the outflow channel as well as the optic nerve. No strong relations were detected between dietary antioxidant intake and the development of POAG, although protective effects from novel antioxidants cannot be ruled out. For example, in another study involving the same health professional group, a statistically significant trend for a protective effect of tea consumption (which is high in bioflavonoid content) was noted. Certainly more study is needed regarding antioxidant intake and glaucoma, as the discovery of novel

antioxidants that may favorably alter the course of POAG would be most welcome. Nevertheless, at this time one cannot promote antioxidant intake as a strategy to prevent the development of POAG or slow its progression. Recently in one study, it is reported that a diet with high n-6 to n-3 polyunsaturated fatty acid ratio was associated with a reduced risk of POAG. Curcumin has shown possible beneficial effects through altering various mechanisms.

Marijuana is proposed as IOP lowering agent. Fortunately in India Marijuana use for even medicinal purposes is illegal. The active ingredient in marijuana (delta-9-tetrahydrocannabinoid) reduces IOP via reduced aqueous humor production. With short term effect, one needs to smoke marijuana every 3 hourly for 24 hour IOP control. ***“keep smoking, keep hallucinating and keep your IOP under control”***. Overall, the existing evidence suggests that marijuana use for glaucoma is not a feasible management option for both medical and legal reasons and it may actually do harm to the patient. Newer pharmaceutical research will have a molecule that separate the therapeutic from unwanted side effects of marijuana with a topically applied agent as a ocular hypotensive agent. In fact, a topical synthetic cannabinoid receptor agonist, WIN 55211-2, does lower IOP in rats, monkeys and humans with a tolerable side-effect profile.

Gingko biloba is one of the components proposed as a neuroprotector. The main components of the ginkgo leaf extract are flavonoid glycosides and terpene lactones. Ginkgo is thought to mediate its effects via several biological mechanisms including antiplatelet action, vasodilation and antioxidant effect. There is little data about the effect of ginkgo biloba on glaucoma. A placebo controlled RCT found that ginkgo biloba improved preexisting visual field loss in some patients with normal tension glaucoma. In a rat model of glaucoma where IOP is elevated after thermal sclerosis of the outflow pathway, ginkgo biloba enhanced retinal ganglion cell survival. Thus, use of ginkgo biloba may not need to be discouraged but it should not be a substitute for conventional glaucoma therapy. Bilberry (shrubs that yield a fruit resembling blueberries) extracts contain high quantities of anthocyanin, a flavonoid with antioxidant properties. While bilberry consumption seems perfectly safe, some studies on the effect of bilberry on glaucoma would be useful.

A Cochrane review completed in 2007 concluded that there is no useful data regarding the effect of acupuncture on glaucoma. Patients should be counseled regarding the paucity of high quality evidence on the use of acupuncture in glaucoma and other diseases.

There are various other herbs and plants have been proposed in various parts of world and they are discussed in recent World Glaucoma Association Consensus book on medical management of Open angle glaucoma.

**To conclude,** There are no well designed studies that have assessed whether ACT may prevent glaucoma or slow disease progression. it is important to know that some form of ACT therapy are not feasible or might be harmful. It is also important to emphasize that even, forms of ACT that probably do no harm should not be substituted for conventional treatment. We need to answers lots of questions before disregarding or allowing “alternative medicine” or using along with our routine practice along with “standard care”.

|  |
|--|
| Summary  |
| <b>No studies show that exercise alters the course of glaucoma.</b>                              |
| <b>Alcohol consumption should not be encouraged as ACT to alter the course of POAG.</b>          |
| <b>Currently, there is no evidence that recommends for specific diet as ACT.</b>                 |
| <b>Marijuana use should not be the management option for glaucoma patients.</b>                  |
| <b>More evidence is required before regarding or recommending ACT for management of glaucoma</b> |