GINKGO BILOBA AND GLAUCOMA

What is ginkgo biloba?
Ginkgo biloba has been used in Chinese traditional medicine for centuries. Extracts of Ginkgo biloba leaves have been suggested for many years to treat various conditions, including dementia, tinnitus, and circulatory problems.

What is the possible mechanism of action?
Different studies have shown that gingko biloba extracts (GBE) may have the following potential benefits:

1. Improved blood flow: Studies have demonstrated that gingko improves ocular blood flow. There are studies in humans that have demonstrated improved peripapillary blood flow. The results of these studies are limited by the methods of measuring ocular blood flow. In addition, these studies did not assess visual field improvement.

2. Neuroprotective effects: Studies have shown that mitochondrial function improves with ginkgo biloba.

3. Antioxidant effect: Ginkgo contains several different flavonoids, including polyphenolic flavonoids which have been proven to exert antioxidative properties by delivering electrons to free radicals. Other compounds, such as vitamins E and C also have antioxidative properties. Ginkgo biloba extract is unlike vitamins E and C, in that the polyphenolic flavonoids are able to act at the mitochondrial level.

4. Anti-inflammatory: Gingko has been shown to decrease reactive oxygen species, in particular nitrogen oxide species (NOS).

Due to their perceived antioxidant, anti-inflammatory and neuroprotective benefits, various flavonoids (and in particular GBE) have been proposed for the treatment of non-pressure-dependent risk factors associated with glaucoma.

Levels of Evidence
1. In vitro studies: antioxidative effect, stabilisation of mitochondrial membranes, reduction in the release of oxidative species, anti-inflammatory activity

2. In vivo studies: Animal models suggest that GBE may have a neuroprotective effect on RGCs. Other studies have shown beneficial impact on blood rheology and vasorelaxative properties. Other benefits has been antivasospastic properties, improved mitochondrial function, improved microcirculation

3. Human clinical trials: Only a few clinical studies have evaluated the effect of gingko extract on glaucoma outcomes. These studies have had contradictory effects with one showing improved visual fields and the other demonstrating no difference. Both studies were small, with short-term treatment (4 weeks). Hence, larger clinical studies are necessary to establish the clinical benefit of ginkgo biloba supplementation in normal and high-tension glaucoma patients. The references for the main studies are listed below.\(^1\,2\,3\)
Summary
One of the most comprehensive reviews of the literature which summarises the evidence suggests that “Based on the present knowledge of the pathogenesis of glaucomatous damage, Ginkgo interferes positively on different steps involved in the pathogenesis of glaucomatous damage (oxidative stress, microcirculation, mitochondrial function etc). However, experimental models for normal tension glaucoma or for glaucomatous progression despite normal IOP do not exist. Therefore, the conclusions are based on extrapolation of other studies. And these extrapolations reveal a clear positive effect of Ginkgo.” However, it is important to discuss with the patient that there are only a few studies in humans and these studies show conflicting results.

GNZ’s position is that gingko supplementation is not a substitute for intraocular pressure reduction. However, if the patient is compelled to consider other treatment pathways, of the alternative treatments available, there is the strongest theoretical evidence for gingko extracts.

Are there any risks associated with ginkgo use?
In general, ginkgo biloba is well tolerated with a low side effect profile. Several systematic reviews on research using ginkgo biloba report no statistical difference in side effects with GBE compared with placebo. There have been some concerns regarding the bleeding risk while on ginkgo supplementation. A systematic review of case reports of bleeding associated with ginkgo showed that out of 15 cases, 13 had other risk factors for bleeding and three cases reported increased bleeding times. A large-scale clinical trials evaluating standardized Ginkgo leaf extracts on elderly patients showed that the incidence of bleeding in patients taking Ginkgo is not significantly higher than in those taking placebo. In rare cases, mild gastrointestinal complaints, headache, and allergic skin reactions have been reported.

Interaction potential during ginkgo biloba treatment
Another area of importance is to consider possible interactions of medications in particular other anti-coagulant medication. Care should be taken if using other medications such as aspirin, heparin or warfarin.
References


