# Vitamin B Supplements Could Aid Glaucoma, Slowing Disease Progression

**Key Takeaways**

- Vitamins B6, B9, B12, and choline supplements slowed glaucoma progression in animal models, indicating potential therapeutic benefits.
- Elevated homocysteine levels do not worsen glaucoma, suggesting they are a consequence rather than a cause of the disease.
- Metabolic abnormalities, particularly in retinal metabolism, are implicated in glaucoma development, highlighting altered vitamin usage.
- A clinical trial is underway to assess the effects of these vitamin supplements in humans with primary open-angle and pseudoexfoliation glaucoma.

New research reveals that B vitamins and choline may slow glaucoma progression, offering hope for innovative treatments beyond traditional methods.

Supplements of vitamins B6, B9, and B12, along with choline, had a positive effect in slowing the development of glaucoma among mice and rats, according to new study findings published by investigators in the journal Cell Reports Medicine, suggesting that elevated levels of homocysteine do not worsen the disease.1

Metabolic Abnormalities in Glaucoma

Glaucoma is an eye condition that causes damage to the optic nerve, which could result in vision loss or blindness. The eye conditions vary depending on the type and stage of the condition, including open-angle glaucoma, acute angle-closure glaucoma, normal-tension glaucoma, pigmentary glaucoma, and glaucoma in children, according to Mayo Clinic.2

While damage to the optic nerve is typically related to high pressure in the eye, glaucoma can still occur with normal eye pressure, but it is a driver of the disease.2 Treatment to lower pressure in the eye often includes eye drops, laser treatment, or surgery; however, results differ among individuals.1

**Homocysteine and Glaucoma**

Previous research has suggested that the substance homocysteine, an amino acid, could be pertinent to understanding the disease.1 Vitamins B12, B6, and folate contribute to the process of breaking down homocysteine to create other chemicals needed in the body. Additionally, when homocysteine interacts with the B vitamins, it converts to 2 substances: methionine and cysteine, both of which are amino acids. However, excess levels of homocysteine greater than 50 mcmol/L could damage the lining of arteries.3

Currently, researchers from the Karolinska Institute are assessing the role of homocysteine in glaucoma among rats and mice with the eye condition. In the experiment, mice and rats were given supplements of vitamin B6, B9, B12, and choline. The findings demonstrated a slower development of glaucoma and halted optic nerve damage in mice and a slowed progression of the disease in rats. The researchers noted that rats included in the study had a more aggressive form of the disease with faster progression, which could contribute to the differing results.1

Researchers also found that high homocysteine levels in glaucoma patients do not correlate with disease progression or genetic susceptibility, suggesting it is a consequence, not a cause. Investigating metabolic pathways, they identified abnormalities, particularly around slower retinal metabolism due to changes in vitamin usage, as playing a role in glaucoma development.1

“Our conclusion is that homocysteine is a bystander in the disease process, not a player. Altered homocysteine levels may reveal that the retina has lost its ability to use certain vitamins that are necessary to maintain healthy metabolism. That's why we wanted to investigate whether supplements of these vitamins could protect the retina,” co-lead on the paper James Tribble, researcher and assistant professor at the Department of Clinical Neuroscience at Karolinska Institute, said in a news release.1

Further results found that eye pressure was not treated among the mice and rats, suggesting that B vitamins and choline impact the disease in a different way compared to lowering eye pressure.1

"The results are so promising that we have started a clinical trial, with patients already being recruited at S:t Eriks Eye Hospital in Stockholm," Tribble said in the news release.1

The ongoing clinical trial includes individuals with primary open-angle glaucoma with slower progression and pseudoexfoliation glaucoma with faster progression.1

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