

# High caffeine consumption may be associated with increased risk of blinding eye disease

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Consuming large amounts of daily caffeine may increase the risk of glaucoma more than three-fold for those with a genetic predisposition to higher eye pressure according to an international, multi-center study. The research led by the Icahn School of Medicine at Mount Sinai is the first to demonstrate a dietary—genetic interaction in glaucoma. The study results published in the June print issue of *Ophthalmology* may suggest patients with a strong family history of glaucoma should cut down on caffeine intake.

The study is important because glaucoma is the leading cause of blindness in the United States. It looks at the impact of [caffeine](#) intake on glaucoma, and [intraocular pressure](#) (IOP) which is pressure inside the eye. Elevated IOP is an integral risk factor for glaucoma, although other factors do contribute to this condition. With glaucoma, patients typically experience few or no symptoms until the disease progresses and they have vision loss.

"We previously published work suggesting that high caffeine intake increased the risk of the high-tension open angle glaucoma among people with a family history of disease. In this study we show that an adverse relation between high caffeine intake and glaucoma was evident only among those with the highest genetic risk score for elevated eye pressure," says lead/corresponding author Louis R. Pasquale, MD, FARVO, Deputy Chair for Ophthalmology Research for the Mount Sinai Health System.

A team of researchers used the UK Biobank, a large-scale population-based biomedical database supported by various health and governmental agencies. They analyzed records of more than 120,000 participants between 2006 and 2010. Participants were between 39 and 73 years old and provided their health records along with DNA samples, collected to generate data. They answered repeated dietary questionnaires focusing on how many caffeinated beverages they drink daily, how much caffeine-containing food they eat, the specific types, and portion size. They also answered questions about their vision, including specifics on if they have glaucoma or a family history of glaucoma. Three years into the study later they had their IOP checked and eye measurements.

Researchers first looked at the relationship between caffeine intake, IOP and self-reported glaucoma by running multivariable analyses. Then they assessed if accounting for genetic data modified these relationships. They assigned each subject an IOP genetic risk score and performed interaction analyses.

The investigators found high caffeine intake was not associated with increased risk for higher IOP or glaucoma overall; however, among participants

with the strongest [genetic predisposition](#) to elevated IOP—in the top 25 percentile—greater caffeine consumption was associated with higher IOP and higher glaucoma prevalence. More specifically, those who consumed the highest amount of daily caffeine—more than 480 milligrams which is roughly four cups of coffee—had a 0.35 mmHg higher IOP. Additionally, those in the highest genetic risk score category who consumed more than 321 milligrams of daily caffeine—roughly three cups of coffee—had a 3.9-fold higher glaucoma prevalence when compared to those who drink no or minimal caffeine and in lowest genetic risk score group.

"Glaucoma patients often ask if they can help to protect their sight through lifestyle changes, however this has been a relatively understudied area until now. This study suggested that those with the highest genetic risk for glaucoma may benefit from moderating their [caffeine intake](#). It should be noted that the link between caffeine and glaucoma risk was only seen with a large amount of caffeine and in those with the highest genetic risk," says co-author Anthony Khawaja, MD, Ph.D., Associate Professor of Ophthalmology University College London (UCL) Institute of Ophthalmology and ophthalmic surgeon at Moorfields Eye Hospital. "The UK Biobank study is helping us to learn more than ever before about how our genes affect our [glaucoma](#) risk and the role that our behaviors and environment could play. We look forward to continuing to expand our knowledge in this area."

Provided by The Mount Sinai Hospital

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