

# Detecting glaucoma before it blinds

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Early detection and diagnosis of open angle glaucoma important so that treatment can be used in the early stages of the disease developing to prevent or avoid further vision loss. Writing in a forthcoming issue of the *International Journal of Medical Engineering and Informatics*, researchers in the US have analyzed and ranked the various risk factors for open angle glaucoma so that patients can be screened at an earlier stage if they are more likely to develop the condition.

Glaucoma is one of the main leading causes of blindness; it is a progressive and irreversible disease. Of the various forms of [glaucoma](#), open angle glaucoma (OAG) is the most common and can cause the most damage. Unfortunately, unless a patient is undergoing regular screening from about the age of 40 years because of a family history, it is otherwise difficult to detect until substantial and irreversible [vision loss](#) has occurred. Glaucoma is the third leading cause of blindness worldwide and the second leading cause of blindness in the USA.

Now, Duo Zhou and colleagues at the University of Medicine and Dentistry of New Jersey, Newark, have used statistical collinearity analysis to evaluate [risk factors](#) for OAG, and logistic regression models to identify a minimum set of such risk factors for prognosis and diagnosis of the disease. Their study was based on more than 400 patients with subtle or severe [vision problems](#) who attended hospital. It reveals the relative risk of being a smoker, age, visual "field test" results, presence of a localized notch or thinning of the neuroretinal rim identified during standard [eye examination](#), cup to disk ratio (a measure of restriction of the [optic nerve](#) at the back of the eye) and other factors.

The data are complex and separating out predictors from diagnostic factors was difficult, the team admits. However, they suggest that family history, medical history, current medications, geographic location, [visual field](#) test and ocular examination must all be considered in diagnosis and prognosis for OAG. They have excluded certain factors from the OAG prognosis: gender, race, [family history](#) of glaucoma, diabetes mellitus, hypercholesterolemia, thyroid disease, migraine, Reynaud's disease and myopia as these have no direct effect on OAG development.

As revealed in the analyses, the odds of developing OAG will be increased by 91% with an increase in the Cup-to-Disc ratio of 0.1. Risk increases by 3% annually by age but decreases by 31% for every dB increase of mean deviation of Humphrey visual field. The odds of developing OAG will be 4.36 higher for patients with abnormal Humphrey visual field overall test, 7.19 higher in patients with localized notch or thinning of the neuroretinal rim. Interestingly, patients with a smoking history seem to be less likely to develop OAG as compared to those with no smoking history; although there are many smokers with OAG. Oddly, because of the location of the study, the team can also say that patients living in Atlantic/Quebec will be 73% less likely to develop OAG compared to their fellow Canadians in Ontario.

**More information:** "Risk factors for open angle glaucoma -analyses using logistic regression" in Int. J. Medical Engineering and Informatics, 2011, 3, 203-222

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