

Largest-ever study of cornea condition reveals hidden risk factors

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Who's at risk of KERATOCONUS?

Largest-ever study finds:

- People with Down syndrome: 6 *times* the normal risk
- African-Americans & Latinos: 50% higher risk
- Asian-Americans: 39% lower risk
- People with diabetes: 20% lower risk
- Men, and people with asthma or sleep apnea: Measurably higher risk

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Key findings from the study. Credit: University of Michigan

A large new study reveals previously unknown risk factors associated with an eye condition that causes serious progressive nearsightedness at a relatively young age.

The findings, made through the largest-ever clinical study of the condition called keratoconus, could help more people receive newer treatments that can slow the problem and protect their vision.

Keratoconus makes the rounded, clear covering of the eye, called the cornea, weak, which leads it to become cone-shaped over time. The last decade has brought new treatment options, but many people don't receive a diagnosis early enough to take full advantage of them.

The new study shows that men, African-Americans and Latinos, and people with asthma, sleep apnea or Down syndrome, have much higher odds of developing keratoconus. But females, Asian-Americans and people with diabetes appear to have a lower risk, the analysis shows.

The findings, made by researchers at the University of Michigan Health System's Kellogg Eye Center and the U-M Institute for Healthcare Policy and Innovation, are published online ahead of print in the journal *Ophthalmology*.

The research was sparked by questions whether changes to the eye with keratoconus affect other parts of the body. Studying eye conditions' associations with other health conditions is easier now because of vast data troves.

"Eye health relates to total body health, and we as ophthalmologists need to be aware of more than just eyeballs when we see patients," says Maria Woodward M.D., an assistant professor of ophthalmology at the U-M Medical School and first author of the new study.

Patients with keratoconus and their families, as well as physicians, should be aware of other potential health problems uncovered in the study, the authors say.

Associations uncovered - or not

The researchers made their findings by looking at data from health insurance claims, half of them from more than 16,000 people with

confirmed keratoconus and half from an equal number of people with similar characteristics but no keratoconus.

This allowed them to see which characteristics and medical conditions were most associated with keratoconus, and which weren't. The people in the study were mostly in their 30s and 40s.

The study helps confirm many suspicions about the condition raised by previous small studies - but casts doubt on others. For instance, men were already known to have a higher risk, which the study confirmed.

And people with Down syndrome had a much higher chance of having keratoconus - six times higher than others - a known risk but still a stark one. This reinforces the high importance of screening and treatment for the condition in members of the Down syndrome community, starting at a young age, Woodward says.

But the higher rates of keratoconus among people of African American and Latino origin - 50 percent higher than whites—were previously unknown. And the finding of a 39 percent lower rate among people of Asian heritage contradicts previous research.

Diabetes and other chronic illness: what's the link to keratoconus?

Meanwhile, there's been debate over a possible "protective" effect of diabetes. While diabetes causes other negative effects to the eye, the cornea may be strengthened as a by-product of those changes.

The new finding of a 20 percent lower odds of keratoconus among people with diabetes, and an even lower odds among those with complications from diabetes, appear to support this idea.

The researchers also looked at other chronic conditions thought to be associated with keratoconus - such as allergic rhinitis, mitral valve prolapse, collagen vascular disease, aortic aneurysm and depression - and found no higher odds of the condition.

But when it came to people who had been diagnosed with sleep apnea - which interrupts breathing during sleep, and can cause snoring, daytime sleepiness and a higher risk of heart disease and stroke - there was a statistically significant higher odds of also having keratoconus. Similarly, people with asthma had higher odds of also having the eye condition.

The authors note that because they used insurance data, they can only see associations of conditions recorded on medical bills, and not cause and effect. And, their findings might not apply to people with no health insurance and therefore less access to medical care.

They also can't tell which of the people had other risk factors for [keratoconus](#), such as [eye](#) rubbing, a family history of the condition, and other conditions not present in the database.

More information: Maria A. Woodward et al. The Association Between Sociodemographic Factors, Common Systemic Diseases, and Keratoconus, *Ophthalmology* (2015). [DOI: 10.1016/j.ophtha.2015.10.035](#)

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