

Scientists hope to curb the nearsightedness epidemic with eye drops

By Emily Mullin November 16, 2015

Lots of people seem to need glasses these days. That's because nearsightedness, or myopia, is becoming increasingly prevalent around the world. More than 40 percent of Americans are nearsighted, up from just 25 percent in the 1970s. In developed Asian countries, that rate is even higher with nearly 90 percent of children developing myopia.

[More evidence that the key to allergy-free kids is giving them plenty of dirt — and cows]

Glasses and contacts offer a corrective solution, but don't actually stop or slow vision's decline. But medicated eye drops may do just that.

In a five-year clinical trial conducted in Singapore, drops of a drug called atropine seemed to slow the progression of nearsightedness in children. Intriguingly, researchers found that a lower dose of the drug was more effective than higher dosages, in addition to risking fewer side effects. The research was presented Nov. 16 at the annual meeting of the American Academy of Ophthalmology in Las Vegas and will appear in the February 2016 edition of the journal Ophthalmology.

[The world's myopia crisis and why children should spend more time outdoors]

“The problem with myopia is if you get it at an early age and you regress, you end up with high myopia,” said lead researcher Donald Tan of the Singapore Eye Research Institute.

And high myopia — where the eyeball stretches and becomes too long — isn't just an inconvenience: It raises the risk of other, more serious eye conditions, such as retinal detachment, macular degeneration, premature cataracts and glaucoma. “So what we've been trying to do for many years is to find out if there's any way to reduce the progression of myopia,” Tan said.

[No, carrots don't make your eyesight better]

Atropine drops are approved for use in the United States at a higher concentration than that used in the study. The drops (which are currently used to treat lazy eye in children) can cause light sensitivity and blurry vision up close at higher doses, so

researchers set out to determine whether a smaller dose could still be effective without producing side effects.

The trial included 400 children ages 6 to 12 who were randomly assigned a nightly dose of atropine: 0.5 percent, 0.1 percent or .01 percent for two years. Doctors then stopped the medication for 12 months and observed whether children's eyes worsened over that period. For children whose eyes became more nearsighted, researchers restarted a treatment of atropine at .01 percent for another two years.

[Why your first-born kid is more likely to be nearsighted]

At the end of the trial, investigators found that children receiving the lowest-dose atropine drops at 0.01 percent were the least myopic when compared to patients treated with higher doses. On average, myopia progression was -0.63, -0.94 and -1.09 D for the 0.01 percent, 0.1 percent and 0.5 percent formulations, respectively. (The "D" stands for diopter, a unit of measurement of the optical power of a lens designed to correct nearsightedness.)

Tan said the findings were surprising because his team didn't expect the lowest dose to work. "For the first time we might have a treatment for myopia in children that looks to be effective," he said.

Michael Repka, a professor of ophthalmology at the Johns Hopkins Wilmer Eye Institute who was not involved in the Singapore study, said treatments for myopia are sorely needed. But Repka said one of the limitations of this study is that it's impossible to know how the subjects' myopia would have progressed – or not progressed – had they not received the eye drop intervention. The study did not include a control group. Repka noted that the children involved in the study still developed myopia, so there's a concern whether the eye drops would be worth it to some patients.

"The reduction in progression is still modest if you look at the overall myopia progress," Repka said.

The researchers also note that about 9 percent of children in the low-dose group did not respond to the drops in the first two years.

[Many scientific studies can't be replicated. That's a problem.]

Still, Repka said, it's good that researchers are investigating drug treatment options for myopia, because it's much easier to administer a medication than try to change the curvature of a patient's eye — a feat scientists elsewhere are trying to accomplish with specially designed contact lenses.

Tan said similar atropine studies are being planned for Japan and Europe. As for this treatment being available in the United States anytime soon, Repka said it would be difficult to do a clinical trial here because the myopia rate is so much lower than in many Asian countries. Also, it's less likely that drug companies would be interested in conducting a trial since the atropine is available as a generic in the United States — and not very profitable as a result.