Myopic Control in the Pediatric Population

As myopia cases are on the rise, researchers are trying to find ways to prevent and slow the progression of myopia through cutting-edge technology,

Elise Agostinelli OD discusses myopia control and the current treatments available.

Featured Speaker:
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Learn more about Elise Agostinelli, OD
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Transcription:

Melanie: Welcome to UAB MedCast. I'm Melanie Cole. And today, we're discussing myopia control treatments in the pediatric world that are becoming more popular. Joining me is Dr. Elise Agostinelli. She's a pediatric optometrist and clinical instructor at UAB Medicine. Dr. Agostinelli, thank you so much for joining us today. Can you tell us a little bit about nearsightedness or myopia and what it is?

Dr Elise Agostinelli: Thanks so much for the opportunity to join you on the podcast, Melanie. This is a very exciting topic I get to talk to you about today. Essentially, nearsightedness or myopia means that the eye is too long and farsighted means that the eye is too short. I've actually always thought these terms nearsightedness and farsightedness were named backwards, but people that are near-sighted see better at near than at a distance and that's the opposite for farsighted.

Single vision prescription glasses and contact lenses are used to correct myopic vision, but fail to treat the underlying problem. When a baby is born, they go through a process called immature fixation. When they are born, there's a broad spectrum of refractive error that becomes more and more narrow.

By age one or two, a child will have very little refractive error. However, with each passing year, their eye grows and potentially develops myopia. So the average age in clinic that we usually see kids develop myopia is about 11 years old.

Melanie: So it's about 11 years old. Tell us a little bit about the clinical presentation, doctor. Is this a cause for concern in younger children and how do we know?

Dr Elise Agostinelli: So usually, the pediatricians do a really great job of screening children, and they'll send them to the pediatric optometrist or ophthalmologist if they notice that they're having difficulties. Myopia at an earlier age can be a cause for concern. Having myopia as a baby or a young child may uncover a more complicated picture. It may be the reason for a child's initial medical referral and an important clue to an underlying systemic or ocular condition. Some of the diseases that are associated with high myopia as a baby or a child is Marfan syndrome, Ehlers-Danlos syndrome, albinism, cerebral palsy, sticklers disease, and Down syndrome.

So even if the pediatrician didn't send a child to us at the clinic, some of the signs that a child may be myopic is having difficulty seeing things at a distance, seeing the board, possibly squinting, or even sometimes headaches. So if the child is having any of those symptoms, it's important to get them in the clinic right away.

Melanie: So do you feel that this is on the rise in our children, doctor? Is there anything about our kids' behaviors? As I was doing my research, I learned a little bit about spending time outdoors versus screen times, and that that can have a positive effect on a child's vision. Can you speak to that just a little bit?

Dr Elise Agostinelli: Yeah. And there are definitely some risk factors that tend to cause myopia or nearsightedness. Unfortunately, one of the main ones is out of our control. For one, the most common race that's myopic is the Asian population. Also, having parents that are myopic is a huge risk factor for myopia. You're actually two times more likely to be myopic if one parent is, and you're actually five times more likely to be myopic if both parents are myopic.

The studies have actually shown that parents with greater than 12 years of education are more likely to have myopic children. However, like you were saying, Melanie, there are some environmental risk factors that you can control the child's chances of becoming myopic or their progression.

The study have shown that increased time on electronics at near have shown to increase myopia. To our myopic patients, we always tell parents to limit their c hild's screen time to 30 minutes to one hour a day. Most parents are usually pretty happy about this recommendation as they already have a hard time limiting their child on devices.

And like you were saying, it's also been studied that increase outdoor time or vitamin D can delay its onset or reduce its progression. So that's just another reason why it's really important for children to stay active. The actual time that they say in the studies have shown to limit the progression is actually 90 minutes of outdoor time a day.

Melanie: Wow. This is such an interesting topic. I mean, we can all certainly use that advise, doctor, about screen time, because we're all in, especially with COVID, on screens all the time now. And I've noticed my eyes feel like they want to close on their own by the end of the night, you know? So tell us a little bit about management and your best advice and certainly management in the pediatric population that other providers are dealing with as well.

Dr Elise Agostinelli: So besides limiting screen time, there's actually different treatment modalities we do as eye care providers to help slow down its progression once a child has actually been diagnosed with myopia. Each treatment recommended is usually patient dependent as they all have high success rates. The average increase in myopia per year for a child is about half a diopter, but that is just the average. Especially with the pandemic, we've seen large jumps in myopia per year due to increased screen time for virtual schooling.

The treatment that I use the most frequently in my clinic is the use of 0.01% atropine. This is a very diluted form of atropine that actually helps to slow down the elongation of the eye because remember we were talking about how nearsightedness means that the eye's too long. The other treatment modalities that are frequently used are multifocal contact lenses and ortho-K contact lenses. These contact lenses require multiple visits to fit the patient in the appropriate lens.

The multifocal contact lenses are actually shaped like a bullseye and have two basic portions for focusing light. The center portion of the lens corrects nearsightedness so that a child's distant vision will remain clear. But it also focuses light directly on the retina. The outer portion of the lens actually focuses power to bring the peripheral light rays into focus in front of the retina. The animal studies have shown that bringing light in front of the retina cues the eye to slow its growth.

There's also ortho-K lenses, which stands for orthokeratology. These lenses are the use of gas-permeable lenses that are actually worn when you're asleep and removed upon wakening. These lenses create a temporary change in the shape of the cornea. Therefore, glasses or contacts do not actually have to be worn during the day, but they must be worn every night to be effective, these contact lenses. If you think about it, it's kind of like a retainer for the eye that you wear at night and removed during the day.

Melanie: Well, thank you for that explanation. And for other providers, how can they counsel their patients to begin treatment? Have you seen that some parents are resistant to treatment for their children? Counsel other providers here, doctor.

Dr Elise Agostinelli: Actually, these treatment modalities have not been FDA-approved yet, but the way we actually have to convince our patients to go on with the treatments is so, you know, why not just give them glasses or contacts. but the concerning thing about myopia is it's side effects. These side effects include increased risk of glaucoma, retinal detachment, cataracts, and choroidal degeneration.

All these risks are actually due to the increased size of the eye and globe expansion of it. The unfortunate thing is these side effects are actually sight-threatening and the patient or child could potentially go blind from them. Usually, this is enough to help the parents make a decision as they are willing to kind of do any treatment for their child to prevent them from developing any further problems or conditions.

Melanie: Wow. That is very important information. Thank you so much, doctor, for joining us today. And physicians can refer a patient to UAB Medicine by calling the MIST line at 1-800-UAB-MIST, or you can always visit our website at uabmedicine.org/physician. That concludes this episode of UAB MedCast. I'm Melanie Cole.