

Update on vitamins and diabetic retinopathy; ethnic norms for preschoolers' eyesight

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This month's *Ophthalmology*, the journal of the American Academy of Ophthalmology, includes a research review of the effects of Vitamins C and E and magnesium on diabetic retinopathy and findings from the first large study of vision problems in Hispanic and African-American infants and young children.

Can Supplements Help People with Diabetes Avoid Retinopathy?

In theory, Vitamins C and E and magnesium could help prevent or limit [diabetic retinopathy](#) (DR), a potentially blinding disease, since each nutrient causes the body to respond in ways that alter retinopathy mechanisms. For example, in animal models Vitamins C and E suppress production of a growth factor, VEG-F, which can promote abnormal blood vessels in the retina. And high dietary levels of magnesium are associated with lower blood pressure and blood sugar, both of which correlate with a lower risk of retinopathy. A research team led by Amanda Adler, MD, PhD, Institute of Metabolic Science, Cambridge, United Kingdom, surveyed studies published from 1988 through 2008 on the impact of these micronutrients on DR. Based on 15 selected studies comprising 4,094 individuals, Dr. Adler says the evidence is not strong enough yet to recommend Vitamins C or E or magnesium supplements for patients with diabetes. She thinks the research should continue, though, and recommends specific parameters.

"It is a very attractive proposition that what one eats, rather than a medication, might reduce the risk of diabetic complications. Ideally, future studies would include frequent measurement of intake of these three nutrients through diet and supplements, standardized exams to identify DR, and agreed-upon biomarkers to assess DR progression," Dr. Adler said. "If such studies showed apparent protection against DR, then a [randomized clinical trial](#) could determine more precisely how a person with diabetes might, or might not, alter his intake of any of these nutrients," she said.

The Adler survey found that in hospital-based studies, participants with higher levels of Vitamin C in their blood were less likely to have DR, but in population-based studies there was no association between dietary intake of Vitamin C and DR. For Vitamin E, no studies showed an association between blood levels or dietary intake and DR risk. For magnesium, one study showed an association between low blood levels of magnesium and DR progression, but other studies were inconclusive.

Assessing Eyesight and Ethnic Group Norms in Young Children

How common are vision disorders in infants and young children, and do rates differ by ethnic group? The Multi-Ethnic Pediatric Eye Disease Study (MEPEDS) based at the Doheny Eye Institute, University of Southern California Keck School of Medicine, is the first large study to consider these questions in preschool-aged children. Rohit Varma, MD, MPH, and colleagues report their findings on refractive error, the leading cause of vision problems in young children. They studied the prevalence of myopia (nearsightedness), hyperopia (farsightedness) and anisometropia (a difference in refractive error between the two eyes) in more than 6,000 Hispanic and African American children (about 3,000 per ethnicity) aged 6 to 72 months.

Overall, about 90 percent of the children were in the normal range (measured in eye exams as less than 1 diopter of myopia and greater than 4 diopters of hyperopia). African-American children were more likely to be myopic (6.6 percent) than Hispanic children (3.7 percent), and rates declined with age in both groups. MEPEDS results suggest that low-level myopia that improves with age may be normal, especially in African American infants: 14 percent were myopic at 6 to 11 months, but only 4 percent at 48 months and older. Other studies show that myopia increases again in both groups in school-aged children. Hyperopia was more prevalent in Hispanic than in African-American children (26.9 versus 20.8 percent, respectively). Prevalence declined between ages 6 and 24 months, then stabilized or increased, indicating that not all children "grow out" of hyperopia. The 2-to-3 year old time period is also when eye misalignment (esotropia, one eye turned inward) is likely to occur, and the researchers think persistent hyperopia and the onset of esotropia may be related.

Anisometropia, defined as a difference of more than 1 diopter of refractive error between the two eyes, was found in 4 to 6 percent of preschoolers in both ethnic groups. Prevalence of this vision disorder declines between 6 months and 2 years, but remained fairly stable after age 2. Anisometropia is associated with strabismus (misaligned eyes) and with amblyopia, also called "lazy eye," in which one eye increasingly does the work of seeing while the other loses vision. If a child with amblyopia receives early and consistent treatment, he or she usually regains normal vision.

"Preschool refractive error screening could detect many children with amblyopia related to anisometropia, so that treatment could be started early," Dr. Varma said. "Studies are needed to further assess anisometropic changes over time and relate anisometropia levels to risk for developing amblyopia and strabismus, so that effective vision screening protocols can be developed."

Provided by American Academy of Ophthalmology

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