In preschoolers, office test overestimates eye's ability to change focus

November 12 2014

In preschool-aged children, a simple test performed in the ophthalmologist's or optometrist's office greatly overestimates the eye's ability to "flex and focus" in order to see small objects clearly, reports a study in the November issue of *Optometry and Vision Science*, official journal of the American Academy of Optometry.

Young children don't have as much "accommodative amplitude" as suggested by the subjective office test—a fact that vision care professionals will need to consider when prescribing glasses for children with defects of close-up vision (farsightedness or hyperopia). The study was performed by Heather A. Anderson, OD, PhD, FAAO, and Karla K. Steubing, PhD, of University of Houston.

Two Tests of Accommodation—from 'Preschool to Presbyopia'

The researchers tested the eye's ability to focus at gradually increasing distances, in individuals ranging from age three to 64 years. "From birth to middle age years the ability to focus separately on objects up close, like books or newspapers, is gradually lost," explains Anthony Adams, OD, PhD, Editor-in-Chief of *Optometry and Vision Science*.

"This gradual loss of ability for the internal eye lens to flex and focus is called loss of accommodation. And when all accommodation is lost it is called presbyopia," Dr Adams adds. "It happens to all of us—none are

spared."

To track age-related changes in accommodation, Drs Anderson and Steubing performed two tests: a subjective test in which patients indicate the distance at which print becomes blurred and out of focus; and an objective test that bounces light into the eye and measures the reflected light focus while the patient is looking at close objects. These subjective and objective test results were compared to characterize changes in accommodative amplitude "from preschool to presbyopia."

The results showed the expected age-related decrease—especially after age 40. For the oldest age group, 51 to 63 years, accommodative amplitude was essentially zero. Across ages, the subjective assessment of accommodation tended to be larger than the objective measure.

But the difference was largest in the youngest age group: age three to five years. For these preschool-aged children, the average objectively measured accommodative amplitude was about half of the subjectively assessed amplitude.

Implications for Prescribing Glasses in Farsighted Kids

Thus the subjective test—widely used not only by ophthalmologists and optometrists, but also by pediatricians and in vision screening programs—could greatly overestimate the ability of young children to focus up close, and to read small print. By age six to ten, the two assessments of accommodation were much closer together, and remained so throughout middle age.

The findings add to previous studies suggesting that subjective testing "substantially overestimates" accommodative ability in young children.

Drs Anderson and Steubing note some important limitations of their study—including the fact that the difference from preschool age to school age may at least partly reflect an improvement in children's ability to perform the test (by stating when a letter "E" becomes "blurred or fuzzy").

Yet in the "real world" of the ophthalmologist and optometrist's office—where the simple subjective test is likely to remain the standard for the near future—it's important for vision care professionals to remember that preschoolers may not actually have the "vast accommodative ability" suggested by their subjective test results. Dr Adams adds, "Clinicians will need to take that into account when they are prescribing glasses for some young children—especially those with moderate to high levels of farsightedness."

More information: "Subjective versus Objective Accommodative Amplitude: Preschool to Presbyopia." journals.lww.com/optvissci/Ful … Accommodative.5.aspx

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