Measuring Dark Adaptation in the Elderly: A Predictor of Who May Develop Macular Degeneration?

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Age-related macular degeneration (AMD) is a complex, multifactorial condition in which dark-adapted, rod-mediated retinal dysfunction exists early on and precedes and/or exceeds cone-mediated retinal dysfunction. However, studies of dark adaptometry in AMD have shown that the recovery kinetics of rod-mediated sensitivity after exposure to a bright bleaching are even more abnormal than what is already suggested by dark-adapted sensitivity measurements. An important corollary to this observation is that a functional biomarker such as measurements of dark adaptation kinetics could be particularly useful to predict which elderly subjects may be at greater risk of AMD and could serve as a very useful outcome measure in AMD trials.

Owsley et al. performed dark adaptometry on elderly subjects with a validated instrument that allows testing in a much shorter time than customary, overcoming two key challenges posed by conventional dark adaptometry testing in the elderly (long duration and patient fatigue). The authors show that, after adjustment for age, 22% of subjects had impaired, baseline dark-adaptation kinetics despite absence of AMD, and that these abnormalities correlated with elevated C-reactive protein, a serological marker of inflammation, and with high blood pressure, and exhibited a J-shaped correlation with alcohol intake. This study is of special interest to AMD research in that it provides potential evidence for a functional biomarker that could precede the onset of detectable AMD.

It will now be interesting to see if the abnormal dark-adaptation kinetics found at baseline will translate in greater risk of developing AMD and if they will correlate with any nutritional factor and/or genetic marker of AMD. If so, studies of dark adaptometry in the elderly may prove invaluable in predicting who is at greatest risk of AMD, leading to earlier and better treatment, and providing an important outcome measure for trials of AMD.

References