Dark adaptation impairment measured by the AdaptDx is a highly accurate diagnostic of AMD

The Diagnostic Sensitivity and Specificity of Dark Adaptometry for Detection of Age-Related Macular Degeneration was a pivotal study of dark adaptation (DA) for the detection of AMD, conducted at Harvard, Johns Hopkins, and Penn State universities. Published in *Investigative Ophthalmology and Visual Science*, it measured dark adaptation speed via an AdaptDx Rapid Test (max duration of 6.5 minutes). Results were compared to clinical trial grading of fundus images to determine whether subjects had normal retinal health or AMD. Dark adaptation assessments proved to be highly sensitive (90.6%) and highly specific (90.5%) to AMD.

The study found the Rapid Test for dark adaptation is a highly accurate measure of dark adaptation impairment associated with AMD and is useful in the detection of the disease.

Rapid dark adaptation testing in AMD detection

Often presented as problems reading or driving at night, impaired dark adaptation function is the first biomarker of AMD. Therefore, assessing how well eyes adapt from bright light to darkness makes it possible to detect dark adaptation impairment consistent with the presence of AMD.

Previous methods for measurement of this biomarker were time intensive (>30 minutes), which made them unsuitable for clinical use. Based on the proven science of dark adaptation, scientists developed a clinically viable Rapid Test that could identify dark adaptation impairment associated with AMD in 6.5 minutes. This Rapid Test was validated with an accuracy of 90.6% – comparable with current visual field tests for glaucoma.

Dark Adaptation

- **Sensitive –** correctly identified **90.6%** of AMD cases
- **Specific –** correctly identified **90.5%** of normal cases
- **Accurate – 90.6%** overall

About the study

The Diagnostic Sensitivity and Specificity of Dark Adaptometry for Detection of Age-Related Macular Degeneration was an NIH-funded multi-site collaboration led by Gregory R. Jackson, PhD. The aim of the study was to find a more practical method of incorporating dark adaptation science into testing for detection of AMD.

Summary:

- The pivotal study compared two cohorts of elderly adults: 127 patients having early-to-advanced AMD and 21 subjects with clinically normal retinal health at baseline, as determined using the Age-Related Eye Disease Study (AREDS) severity grading system.
- The rapid test was found to have a diagnostic sensitivity of 90.6% ($P < 0.001$) and specificity of 90.5% ($P < 0.027$). Thus, abnormal DA was detected in 115 of 127 AMD patients, and normal DA was found in 19 of 21 normal adults.
- The high diagnostic sensitivity and specificity compared favorably to long duration research methods for the measurement of DA, and slit lamp biomicroscopy performed by a retina specialist. These results suggest that a rapid DA test is useful for the detection of AMD.

[1]Jackson GR, Scott IU, Kim IK, Quillen DA, Iannaconne A, Edwards JG. Diagnostic Sensitivity and Specificity of Dark Adaptometry for Detection of Age-Related Macular Degeneration. *Invest Ophthalmol Vis Sci.* 2014;55:1427-1431 doi:10.1167/iovs.13-13745.

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