Optical coherence tomography of drusenoid pigment epithelial detachments in the Age-Related Eye Disease Study 2

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Purpose:

Drusenoid pigment epithelial detachments (DPEDs) present in age-related macular degeneration (AMD) are associated with increased risk of progression to geographic atrophy (GA). We analyzed DPEDs using spectral-domain optical coherence tomography (SD-OCT) to determine features influencing DPED progression in the Age-Related Eye Disease Study 2 (AREDS2) Ancillary SD-OCT (A2A) Study.

Methods:

A2A prospectively performed SD-OCT on a subset of AREDS2 participants (4 sites) with intermediate AMD. DPED was defined on color fundus photography (CFP) as an elevated mount of large soft confluent drusen ≥433 µm. This study included eyes with DPED present on CFP at any time. The Duke Reading Center graded SD-OCT volume B-scans for features including hyperreflective foci (HRF), photoreceptor layer thinning, and subretinal fluid. DPED maximum length and height were measured then followed longitudinally for occurrences of DPED collapse, development of neovascular AMD (NVAMD), or development of complete retinal pigment epithelial and outer retinal atrophy (cRORA).

Results:

Of 31 eyes with DPED present based on CFP, 6 were excluded for having non-DPED pathologies (fibrosis, epiretinal membrane, and vitelliform lesion) on multimodal review. Sensitivity of CFP for detecting DPED on the same visit as an OCT was 40.8% and specificity was 76.3%. There were no incident DPEDs. At the time when DPED was first identified on CFP, DPED length averaged 1860±691 µm and height averaged 206±58 µm.

Longitudinal data were available for 24 eyes with a median follow-up of 4.0 (interquartile range 3.7, 4.7) years. Six eyes (25%) developed NVAMD. Based on SD-OCT, 11 eyes (45.8%) had persistent DPEDs and 7 eyes (29.2%) had DPED collapse, 42.9% (3 eyes) of whom developed cRORA (i.e. GA) by their last follow-up visit. Eyes that developed NVAMD tended to have greater maximum DPED lengths and heights than those of eyes that developed DPED collapse and eyes with persistent DPEDs in the years preceding neovascularization. All eyes that experienced DPED collapse or converted to NVAMD had HRF at A2A study enrollment and prior to DPED collapse or neovascularization.

Conclusions:

Addition of SD-OCT imaging to CFP may allow earlier detection of DPEDs and provide additional information relevant to risk of disease progression.