Abstract 201

AUTOMATED DETECTION OF SMALL HYPERREFLECTIVE SPECKS AND FLECKS IN NON-NEOVASCULAR AGE-RELATED MACULAR DEGENERATION USING ULTRAHIGH RESOLUTION OPTICAL COHERENCE TOMOGRAPHY

Oral

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Purpose:

Hyperreflective foci are associated with the progression of non-neovascular age-related macular degeneration (AMD). The purpose of this study was to evaluate the ability of ultrahigh resolution spectral domain OCT (UHR SD-OCT) to detect the presence of smaller hyperreflective features, such as specks and flecks, in volumetric datasets.

Methods:

Adult participants with age-matched healthy macula (n=15), early AMD (n=20), and intermediate AMD (n=48) were enrolled in the study. An UHR SD-OCT prototype instrument with an axial resolution of ~2.7µm and an extended imaging range was utilized to acquire high-definition volumetric datasets over 9mm by 6mm with an A-scan spacing of 5µm. An automated, local peak-detection algorithm was developed to extract and quantitatively assess hyperreflective specks and flecks. The algorithm outputs were compared to manual labeling to evaluate detection accuracy. En face projections of outer retinal layers were compared with en face map of the detected hyperreflective features.

Results:

High-definition volumetric acquisition of UHR SD-OCT revealed the presence of small (~5µm) hyperreflective features with varying shapes and reflectivity. Hyperreflective features were detected in the outer nuclear layer and external to the external limiting membrane from age-matched healthy, early AMD, and intermediate AMD eyes. The algorithm generated en face map of the detected hyperreflective features, as well as their relative location in depth and quantity. The number of detected small hyperreflective features in age-matched healthy eyes was much lower than that in eyes with AMD.

Conclusions:

Hyperreflective specks and flecks, along with the conventional hyperreflective foci, are potentially quantifiable using the UHR SD-OCT and the automated detection. Longitudinal monitoring of small hyperreflective features and their neighboring lesions may help to develop biomarkers for disease progression in patients with AMD.