AUTHORS

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Study Group: MacTel Study group

ABSTRACT

TITLE: Novel software to assess correlation between MAIA microperimetry and OCT imaging of ellipsoid zone in type 2 idiopathic macular telangiectasia

ABSTRACT BODY:

Purpose: To correlate ellipsoid zone (EZ) defects as viewed on en face spectral-domain optical coherence tomography (SD-OCT) with retinal sensitivity loss on MAIA microperimetry in type 2 idiopathic macular telangiectasia (type 2 MacTel).

Methods: Macular SD-OCT volumes and mesopic microperimetry sensitivity maps were obtained during screening and baseline visits of the phase 2 trial of ciliary neurotrophic factor (CNTF) for type 2 MacTel (NTMT-02, Neurotech). Novel software with user-friendly graphical user interface (GUI) and image processing algorithms were developed to estimate EZ defect areas after registering the en face SD-OCT volumes and corresponding individual B-Scans from the screening visit with the microperimetry maps obtained at baseline and screening visits.

Results: 98 eyes of 49 patients were investigated. Mean right eye BCVA was 74.6±8.1 letters (Snellen 20/30) and left eye BCVA was 76.5±9.1 letters (20/30). Microperimetry sensitivity measurements had high repeatability between the two visits that were performed within 5 days of each other (ICC for average retinal sensitivity outside EZ defect: 0.723, 95% CI: 0.613-0.805; ICC for average sensitivity within EZ defect: 0.784, 95% CI: 0.693-0.850; ICC for aggregate sensitivity loss within EZ defect: 0.969, 95% CI: 0.954-0.979). Average retinal sensitivity within the EZ defect area was 14.8±7.6 dB at screening and 14.0±7.1 dB at baseline in right eyes and 14.3±8.7 dB at screening and 14.3±8.7 dB at baseline in left eyes. Aggregate retinal sensitivity loss within EZ defect area was significantly correlated with EZ defect area (Pearson correlation coefficient 0.919, p< 0.001 at screening and 0.919, p<0.001 at baseline). Interestingly, we found areas of EZ defects that corresponded to non-scotomatous loci on microperimetry testing.

Conclusions: The robust semi-automatic, locally deformable registration algorithm was found to be accurate, as assessed by the nearly perfect overlap of the retinal vessels on en-face OCT with those on microperimetry maps. Our novel software allows determination of functional and structural changes with increasing disease severity and demonstrates that EZ loss on SD-OCT is a surrogate marker and early predictor of photoreceptor functional loss in type 2 MacTel.

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DETAILS

PRESENTATION TYPE: #1 Paper, #2 Poster
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CURRENT SECTION: Retina
KEYWORDS: 252 imaging: Novel techniques, 240 image processing: Registration, 290 macula/fovea.
Clinical Trial Registration (Abstract): Yes - http://www.clinicaltrials.gov
Other Registry Site (Abstract):
Registration Number (Abstract): NCT01949324
Date Trial was Registered (MM/DD/YYYY) (Abstract): 09/19/2013
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TRAVEL GRANTS and AWARDS APPLICATIONS

AWARDS: ARVO / Alcon Early Career Clinician-Scientist Research Award