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TITLE

Potentialities of developing and evaluating OCT biomarkers for detecting early retinal damage in diabetic patients using optical coherence tomography

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Diabetic retinopathy (DR), a disease that is responsible for ~ 10,000 new cases of blindness every year in the United States alone, may be the most common microvascular complication of diabetes. Recent research has suggested that structural damage in retinal layers may precede visual field loss in diabetic eyes. Optical coherence tomography (OCT) has become an important tool which has improved the clinical management of DR and contributed to the early detection of retinal damage in the diabetic eye. This presentation details the potentialities of developing and evaluating OCT biomarkers for detecting diabetic retinal disease at the early stage. A cross-sectional study consisting of 74 normal eyes, and 39 eyes with type 1 diabetes mellitus with no retinopathy (DM), and 36 eyes with mild diabetic retinopathy (MDR) on biomicroscopy was performed. Automatic layer segmentation was achieved using a custom-built algorithm (OCTRIMA). Intraretinal layer thickness and optical parameter measurements were extracted from OCT raw images of all study's participants. OCT biomarkers obtained from OCT data were compared between the groups using ANOVA followed by Newman-Keuls tests. A p value of <0.05 was considered statistically significant. Discriminating power for early DR detection was expressed by using the analyses of area under the receiver operating characteristic curves (AUCs). OCT may offer comprehensive analysis for structural and optical biomarkers which showed good diagnostic ability in distinguishing normal from eyes with early DR. Our study showed that the OCT technology may help clinicians identify the presence of early DR damage. Future more extensive studies will determine how this new technology can further benefit early DR diagnosis and management.

Biography

Delia Cabrera DeBuc received her PhD degree in Applied Physics (2002) from the University of Michigan. She is currently a Research Associate Professor at the Bascom Palmer Eye Institute. She is a biophysicist with specific training in imaging technology and image analysis. Her research interests include the development and application of quantitative ophthalmic imaging analysis to enhance ocular health capabilities. She currently serves as the PI for a NIH's grant focusing on early detection of diabetic retinopathy using Optical Coherence Tomography. She has presented nationally and internationally on various aspects of ocular imaging analysis and corneal biomechanics.