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DIAGNOSIS OF ALZHEIMER'S DISEASE USING OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY AND MACHINE LEARNING

Poster

Yoon J.M.*^[1], Lim C.Y.^[2], Noh H.^[1], Nam S.W.^[1], Kim K.^[3], Ham D.^[1]

^[1]Department of Ophthalmology, Samsung Medical Center, Sungkyunkwan University School of Medicine ~ Seoul ~ Korea, Republic of, ^[2]Department of Medical Device Management and Research, SAIHST, Sungkyunkwan University ~ Seoul ~ Korea, Republic of, ^[3]Department of Data Convergence and Future Medicine, Sungkyunkwan University School of Medicine, Medical AI Research Center, Samsung Medical Center ~ Seoul ~ Korea, Republic of

Purpose:

To investigate the diagnostic ability of the foveal avascular zone (FAZ) in Alzheimer's disease using optical coherence tomography angiography (OCTA) and machine learning.

Methods:

This prospective cross-sectional study included 20 patients with Alzheimer's disease and 35 subjects with normal cognitive function (control). All subjects were confirmed by amyloid positron emission tomography and underwent OCTA. The FAZ was automatically segmented using artificial intelligence from each OCTA image of the superficial capillary plexus. Multiple features (area, convexity, roundness, solidity, eccentricity, compactness, elongation, and convexity defect) of FAZ were extracted and used for training of the classification algorithm based on gradient boosting with 5-fold cross validation. The diagnostic ability of Alzheimer's disease was assessed by the area under the receiver operating characteristic curve (AUC).

Results:

Among multiple features of FAZ, area, roundness, solidity, eccentricity, and compactness were effective in the diagnosis of Alzheimer's disease. In the classification only using FAZ area, AUC was 0.63 ± 0.05 . When all effective features were used in the classification, the AUC increased to 0.71 ± 0.05 .

Conclusions:

Multiple FAZ features extracted by machine learning showed the diagnostic ability of Alzheimer's disease. The FAZ can be considered as a potential biomarker of Alzheimer's disease.