Washington University in St. Louis
Office of Technology Management

EYE TEST TO DIAGNOSE PRECLINICAL ALZHEIMER'S DISEASE

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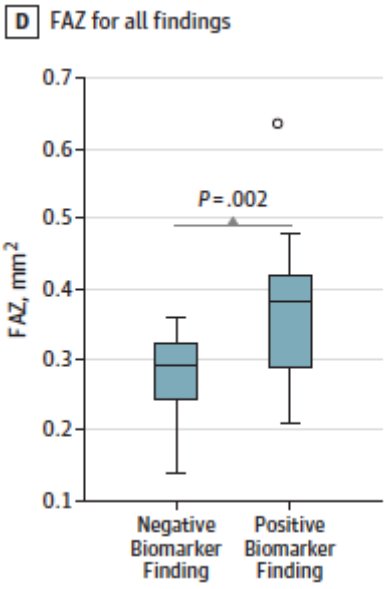
Technology Description

Researchers at Washington University in St. Louis have developed a non-invasive screening method using optical coherence tomography angiography (OCTA) to detect Alzheimer's disease (AD) at the early, preclinical stage. AD is characterized by progressive memory loss, behavioral changes, and loss of executive function. Unfortunately, these symptoms only become apparent after irreversible neuron loss has occurred. Preclinical AD is a recently-realized, silent disease stage in which the pathological changes have started but symptoms have not yet appeared. Early therapeutic intervention at this stage may offer the best chance for successful treatment. Biomarkers for preclinical AD have been developed but they are expensive and invasive. Thus, new methods of diagnosing preclinical AD are needed. To help meet this need the inventors have taken advantage of recent work from their labs. Using OCTA, they have discovered that patients with preclinical AD have changes in retinal vasculature and thickness, including enlargement of the foveal avascular zone (FAZ). As such, measuring the FAZ thickness with OCTA may serve as an indicator for AD. This technology has the potential to serve as a rapid, non-invasive method to screen and identify patients with preclinical AD.



The FAZ was larger in participants with biomarker-positive, preclinical AD.

Stage of Research

The inventors' pilot, clinical study suggests that cognitively normal subjects with preclinical AD have retinal microvascular abnormalities in addition to architectural alterations that can be detected by OCTA.

Publications

- O'Bryhim BE, Apte RS, Kung N, Coble D, Van Stavern GP. Association of Preclinical Alzheimer Disease With Optical Coherence Tomographic Angiography Findings. *JAMA Ophthalmol*. 2018;136(11):1242-1248. doi:10.1001/jamaophthalmol.2018.3556
- Dryden, J. Alzheimer's one day may be predicted during eye exam. Washington University in St. Louis's the Source. 2018, Aug 23.

Applications

- Diagnostic for preclinical AD
- Screening tool for patient stratification for clinical trials

Key Advantages

- Potential to diagnose AD before symptom onset
- Non-invasive
- Inexpensive
- Rapid
- Provides an additional setting for AD diagnosis- the ophthalmologist office

Patents

- Patent application- Methods for detecting neurodegenerative disease (WO 2019/165049)

Related Web Links

- Dr. Rajendra Apte profile
- Dr. Gregory Van Stavern profile