

Retinal microvascular alterations related to diabetes assessed by optical coherence tomography angiography

Thesis

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Summary

Diabetic retinopathy represents one of the leading causes of visual impairment and blindness in the world. It is essentially a microangiopathy that causes capillary occlusion, vascular hyperpermeability and neovascularization in the retina.

OCTA is a noninvasive technique that facilitates imaging of perfused retinal and choroidal vascular structures within specific layers. Over the past decades, FA has been the gold standard procedure to explore DMI. However, it has limitations, the most common being fluorescein injection, which can trigger frequent benign symptoms such as nausea and, rarely, severe reactions such as anaphylactic shock.

In **our study**, all diabetic patients had significantly lower vessel density values at the level of the superficial and deep capillary plexus when compared with control patients. We also observed an enlargement of FAZ area and perimeter as the disease progresses. FAZ area was $0.390 \pm 0.05 \text{ mm}^2$, $0.400 \pm 0.03 \text{ mm}^2$ and $0.510 \pm 0.01 \text{ mm}^2$ in mild NPDR group, moderate and severe NPDR group respectively.

OCTA can clearly visualize microaneurysms and retinal non-perfused areas and quantitative information on new vessels can also be obtained. Together with the easy operation of the device, short acquisition time, and avoidance of potentially phototoxic blue light, suggest that OCTA holds promise as a tool for monitoring ocular pathology and detecting early disease.