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NON-INVASIVE CHARACTERIZATION OF INTRARETINAL MICROVASCULAR ABNORMALITIES WITH WIDEFIELD SWEPT SOURCE OCTA IMAGING

Oral

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Purpose:

To explore the use of non-invasive methods such as Wide-Field Swept-Source optical coherence tomography angiography (SS-OCTA) to identify and characterize intra-retinal microvascular abnormalities (IRMA) in severe non proliferative diabetic retinopathy (PDR) or PDR patients.

Methods:

26 eyes from diabetes type 2 individuals were imaged with 7-Fields Color Fundus Photography (CFP) and SS-OCTA Zeiss PlexElite 9000 using Wide-Field Angio 15x9mm protocols. Regions suspicious for IRMA were first identified in CFP and then searched in SS-OCTA co-locations on the Superficial Capillary Plexus (SCP) and Vitreous-Retina Interface (VRI) slabs. When detected, presence of surrounding capillary non-perfusion, overlayed flow, hyperreflective dots in inner retina, protrusion of inner limiting membrane (ILM) and breach of ILM with or without breach of posterior hyaloid (PH) were analyzed. Fluorescein angiography (FA) was used to confirm the presence of new vessels.

Results:

Of the total number of IRMAs identified by SS-OCTA (n=69), 80% (n=55) were located in non-perfused areas with 73% (n=40) showing some degree of flow. 82% (n=56) were confirmed within ILM without breaching PH, while 14% (n=10) seem to cause an ILM protrusion with detectable flow in both SCP and VRI slabs.
Only 4% (n=3) were identified as new vessels on OCTA due to its location above PH and detection in the VRI slab. All these proliferation loci showed leakage on FA.

Conclusions:

Wide-Field SS-OCTA images are a valuable tool to identify IRMA and early stages of vascular neo-proliferation, allowing an improved characterization of these vascular lesions and offering an accurate non-invasive alternative to FA for its detection.