

Abstract 188

VESSEL DENSITY METRICS USING SWEEP-SOURCE OCTA DISCRIMINATES SEVERITY STAGING OF NPDR - THE CHART STUDY

Oral

Cunha--Vaz J.*^[1], Marques I.P.^[2], Parravano M.C.^[3], Creuzot--Garcher C.^[4], Mastropasqua L.^[5], Bandello F.^[6]

^[1]1- AIBILI - Association for Innovation and Biomedical Research on Light and Image, Coimbra, Portugal; 2-University of Coimbra, Coimbra Institute for Clinical and Biomedical Research (iCBR), Faculty of Medicine, Coimbra, Portugal ~ Coimbra ~ Portugal, ^[2]AIBILI - Association for Innovation and Biomedical Research on Light and Image ~ Coimbra ~ Portugal, ^[3]IRCCS-Fondazione Bietti ~ Rome ~ Italy, ^[4]Department of Ophthalmology, CHU Dijon ~ Dijon ~ France, ^[5]Excellence Eye Research Centre ~ Chieti-Pescara ~ Italy, ^[6]Department of Ophthalmology Vita-Salute University, San Raffaele Scientific Institute ~ Milan ~ Italy

Purpose:

To test whether the location of a single or composite set of parameters evaluated with swept-source optical coherence tomography angiography (SS-OCTA) and representing retinal capillary closure, can discriminate non-proliferative diabetic retinopathy (NPDR) staging according to the gold standard ETDRS grading.

Methods:

One-hundred and thirty-four eyes from diabetic patients with different severity stages of NPDR were evaluated using SS-OCTA (PlexElite – Carl Zeiss Meditec) using the 15 x 15mm angiography protocol. Seven-field photographs of the fundus were obtained for ETDRS staging.

Eyes were separated based on their ETDRS severity grade. SS-OCTA perfusion density (PD) and vessel density (VD) metrics were compared for each severity group.

Results:

SS-OCTA metrics of VD and PD in the deep capillary plexus (DCP) obtained with SS-OCTA show statistically significant differences between ETDRS 35 and ETDRS 43-53 severity groups in the perifovea (p-value = 0.002) and in the retina mid-periphery (p-value < 0.001). Differences were also identified in the superficial capillary plexus (SCP) in the retina midperiphery (Extended Ring 3, 12mm < Radius < 15mm) for both VD and PD.

Conclusions:

Information of non-capillary perfusion in the mid-periphery of the retina obtained using wide-field OCTA (PlexElite) is particularly relevant to identify NPDR progression and discriminate between ETDRS 35 (mild NPDR) from ETDRS 43-53 (moderate and severe NPDR).

Comparison between central and midperiphery on SS OCTA Angiography 15x15mm - ETDRS 35 vs ETDRS 43 - 47

			ETDRS 35 (N = 63)	ETDRS 43-47 (N = 41)	35 vs 43-47
Vessel Density	CSF	SCP	6.8 ± 2.6	6.9 ± 2.9	0.934
		DCP	1.1 ± 1.6	1.0 ± 1.3	0.446
		FR	6.7 ± 2.6	6.9 ± 3.3	0.881
	Inner Ring	SCP	15.0 ± 2.2	14.9 ± 1.9	0.547
		DCP	9.8 ± 2.7	9.1 ± 2.5	0.083
		FR	16.4 ± 2.2	16.5 ± 1.9	0.808
	Outer Ring	SCP	15.9 ± 1.8	15.9 ± 1.5	0.579
		DCP	10.5 ± 2.6	8.9 ± 2.3	0.002
		FR	17.1 ± 1.7	17.0 ± 1.4	0.487
	Ext 1	SCP	15.7 ± 1.7	15.6 ± 1.2	0.314
		DCP	9.4 ± 2.5	7.5 ± 2.0	p < 0.001
		FR	16.8 ± 1.6	16.5 ± 1.1	0.090
	Ext 2	SCP	13.5 ± 1.5	13.2 ± 1.4	0.212
		DCP	8.3 ± 2.7	6.4 ± 2.0	p < 0.001
		FR	14.9 ± 1.6	14.4 ± 1.4	0.062
	Ext 3	SCP	11.3 ± 2.0	10.5 ± 1.8	0.034
		DCP	6.7 ± 2.8	4.4 ± 2.0	p < 0.001
		FR	12.7 ± 2.2	11.6 ± 1.9	0.004

			ETDRS 35 (N = 63)	ETDRS 43-47 (N = 41)	35 vs 43-47
Perfusion Density	CSF	SCP	0.15 ± 0.06	0.15 ± 0.07	0.902
		DCP	0.02 ± 0.04	0.02 ± 0.03	0.411
		FR	0.15 ± 0.06	0.16 ± 0.08	0.868
	Inner Ring	SCP	0.35 ± 0.05	0.35 ± 0.05	0.606
		DCP	0.22 ± 0.06	0.20 ± 0.06	0.097
		FR	0.39 ± 0.05	0.39 ± 0.05	0.928
	Outer Ring	SCP	0.39 ± 0.04	0.39 ± 0.03	0.687
		DCP	0.24 ± 0.06	0.20 ± 0.05	0.002
		FR	0.42 ± 0.04	0.42 ± 0.03	0.722
	Ext 1	SCP	0.40 ± 0.04	0.40 ± 0.03	0.588
		DCP	0.22 ± 0.06	0.17 ± 0.05	p < 0.001
		FR	0.42 ± 0.04	0.42 ± 0.02	0.251
	Ext 2	SCP	0.35 ± 0.04	0.34 ± 0.03	0.193
		DCP	0.19 ± 0.06	0.15 ± 0.05	p < 0.001
		FR	0.38 ± 0.04	0.37 ± 0.03	0.096
	Ext 3	SCP	0.29 ± 0.05	0.27 ± 0.04	0.045
		DCP	0.15 ± 0.06	0.10 ± 0.05	p < 0.001
		FR	0.32 ± 0.05	0.29 ± 0.04	0.006