

CORRELATION BETWEEN DIABETIC MACULAR EDEMA AND PERIPHERAL RETINAL ISCHEMIA USING ULTRA-WIDE FIELD FLUORESCEIN ANGIOGRAPHY

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INTRODUCTION

Diabetic retinopathy is typically asymptomatic in the early stages. Diabetic macular edema is an important manifestation of DR that can be seen at any stage of diabetic retinopathy, as early as NPDR, although it is more common in more severe stages. Fluorescein angiography (FA) is the gold standard tool for visualizing retinal vasculature that has been used for over more than 30 years to assess chorioretinal disorders. Fluorescein angiography is the best way to diagnose retinal ischemia which represents retinal non-perfusion or capillary dropout. Ultra-wide-field (UWF) photography is described by the Diabetic Retinopathy Clinical Research Network (DRCRnet) as fundus photography having a field of view of at least 100 degrees.

Aim of the work

The aim of this work was to evaluate the relation between macular edema and peripheral retinal ischemia in patients with diabetic retinopathy using Spectral Domain Optical Coherence Tomography (OCT) and Ultra- Wide Field Fluorescein angiography (UWFA) imaging techniques.

PATIENTS

This study was conducted on 50 eyes of diabetic patients diagnosed clinically, by fluorescein angiography and optical coherence tomography as having diabetic retinopathy with macular edema.

METHODS

For each case, the following was conducted: **1. History:** (a) Age and Gender (b) Associated ocular disease (c) Prior ocular surgeries (d) History of ocular trauma **2. Clinical Ophthalmological examination: including** (a) Best-corrected visual acuity (b) Anterior segment examination: (c) Intraocular pressure measurement: (d) Dilated fundus examination **3. Optical coherence tomography:** - Spectral domain optical coherence tomography was done using the OCT (HD-OCT Cirrus5000). **4. Fluorescein angiography**

RESULTS

Table1 shows results of several Pearson’s correlation tests between our variables. Ischemic index was positively correlated with duration of DM (p-value: 0.049) and the OCT CFT (p-value: 0.042; **Figure 1**). The macular volume showed similar, but more statistically significant correlations with duration of DM (p-value: <0.001) and the OCT CFT (p-value: 0.007). A border-line significant correlation between ischemic index and macular volume was also noted (p-value: 0.061).

Table 1: Pearson’s correlation between various background and disease-related variables

Parameter1	Parameter2	p-value	Coefficient (95% CI)
Visual acuity	Duration of diabetis (years)	0.557	0.09 (-0.2 to 0.36)
Visual acuity	OCT CFT	0.452	0.11 (-0.17 to 0.38)
Visual acuity	Ischemic index (%)	0.444	0.11 (-0.17 to 0.38)
Visual acuity	Macular volume (mm3)	0.045*	0.28 (0.01 to 0.52)
Duration of diabetis (years)	OCT CFT	0.691	0.06 (-0.22 to 0.33)
Duration of diabetis (years)	Ischemic index (%)	0.049*	-0.28 (-0.52 to 0)
Duration of diabetis (years)	Macular volume (mm3)	<0.001***	-0.47 (-0.67 to -0.23)
OCT CFT	Ischemic index (%)	0.042*	0.29 (0.01 to 0.53)
OCT CFT	Macular volume (mm3)	0.007**	0.38 (0.11 to 0.59)
Ischemic index (%)	Macular volume (mm3)	0.061	0.27 (-0.01 to 0.51)

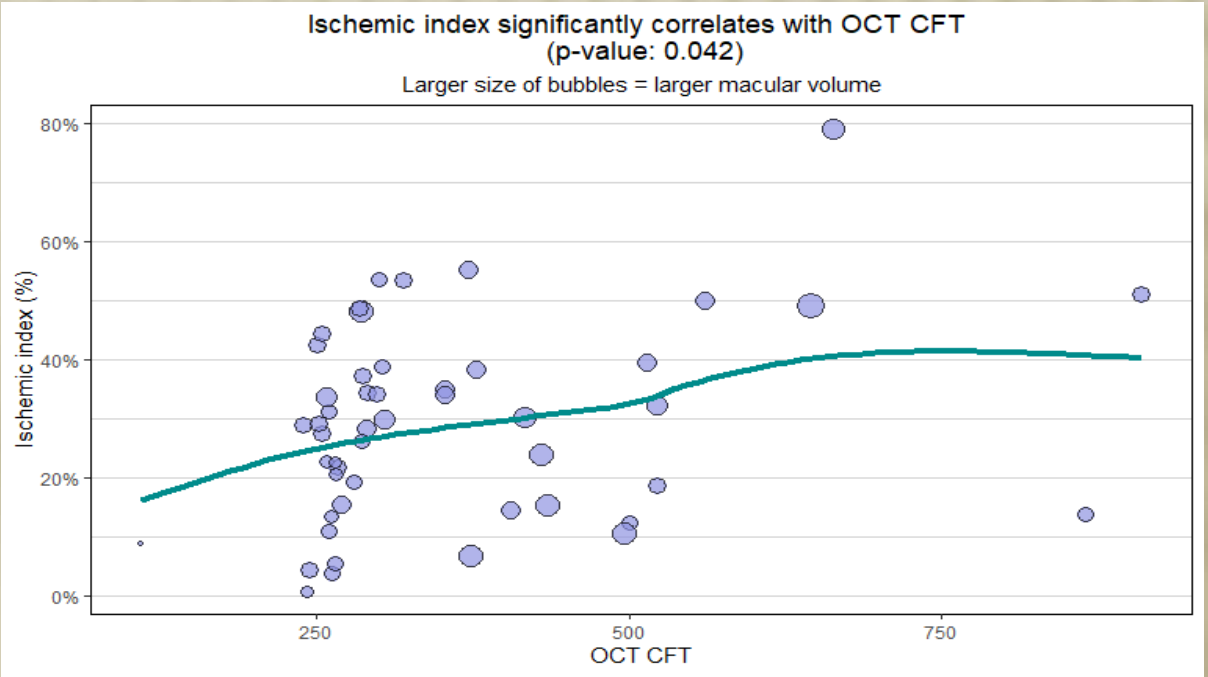


Figure 1: A scatter-plot featuring the correlation between OCT CFT and ischemic index

CONCLUSION

Heidelberg WFA is a useful tool for the assessment of peripheral ischemia in eyes with DME. More advanced grades of NPDR are associated with more peripheral ischemia. Although PDR tends to be associated with more peripheral ischemia than NPDR, there is no sharp cut in ischemic index between severe NPDR and PDR. In eyes with treatment naive DME, more advanced grades of peripheral ischemia tend to be associated with more macular volume. There is a positive correlation between central fovea thickness and ischemic index in eyes with treatment naive DME.

