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Vujosevic, MicroPulse

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Retina. 2010 Jun;30(6):908-16.

Microperimetry and fundus autofluorescence in diabetic macular edema: subthreshold micropulse diode laser versus modified early treatment diabetic retinopathy study laser photocoagulation.

Vujosevic S, Bottega E, Casciano M, Pilotto E, Convento E, Midena E.

Fondazione GB Bietti, IRCCS, Rome, Italy. stelavu@hotmail.com

Abstract

PURPOSE: The purpose of this study was to evaluate and compare microperimetry and fundus autofluorescence (FAF) after subthreshold **micropulse** diode laser versus modified Early Treatment Diabetic Retinopathy Study photocoagulation for clinically significant diabetic macular edema.

METHODS: A prospective randomized clinical trial including 62 eyes (50 patients) with untreated, center-involving, clinically significant diabetic macular edema was performed. All patients underwent best-corrected visual acuity determination (logarithm of the minimum angle of resolution), slit-lamp biomicroscopy, FAF, optical coherence tomography, microperimetry (macular sensitivity), and fluorescein angiography before and after treatment. Best-corrected visual acuity, optical coherence tomography, microperimetry, and FAF were repeated at 1-, 3-, 6-, 9-, and 12-month follow-up examinations. Fluorescein angiography was performed at baseline and at 6 and 12 months.

RESULTS: Before treatment, demographic and macular parameters were not different between the two treatment groups. At 12 months, best-corrected visual acuity remained stable in both groups ($P = 0.41$ and $P = 0.82$), mean central retinal thickness decreased in both groups ($P = 0.0002$ and $P < 0.0001$), and mean central 4 degrees and 12 degrees retinal sensitivity increased in the **micropulse** diode laser group ($P = 0.02$ and $P = 0.0075$) and decreased in the Early Treatment Diabetic Retinopathy Study group ($P = 0.2$ and $P = 0.0026$). There was no significant difference in either best-corrected visual acuity or central retinal

thickness between the 2 treatment groups ($P = 0.48$ and $P = 0.29$), whereas there was a significant difference in 4 degrees and 12 degrees retinal sensitivity ($P = 0.04$ and $P < 0.0001$). Fundus autofluorescence never changed in the **micropulse** diode laser group even after retreatment. In the Early Treatment Diabetic Study group, FAF increased up to 9 months and decreased in 6 eyes (20%) at 12 months.

DISCUSSION: **Micropulse** diode laser seems to be as effective as modified Early Treatment Diabetic Retinopathy Study laser photocoagulation in the treatment of clinically significant diabetic macular edema. **Micropulse** diode laser treatment does not determine any change on FAF showing (at least) nonclinically visible damage of the retinal pigment epithelium. Microperimetry data encourage the use of a new, less aggressive laser therapeutic approach in the treatment of clinically significant diabetic macular edema.

PMID:20168272[PubMed - indexed for MEDLINE]

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