

A New Automated and Quantified Macular Metamorphopsia Measurement in Choroidal Neovascularization Treated with Photodynamic Therapy

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Abstract

Background: Guidelines for re-treatment of photodynamic therapy with verteporfin (PDT) are still evolving. Although re-treatment at 3-month intervals has been recommended based on several PDT trials, leakage of choroidal neovascularization (CNV) lesions may occur at different intervals among individuals. An objective and quantifiable method to evaluate CNV lesions following PDT treatments may be useful to determine the most appropriate timing for re-treatment.

Objective: To determine the ability of Peripheral Hyperacuity Perimetry (PHP) to quantify the metamorphopsia field defect caused by the CNV lesion before and after PDT, and determine if this information could be used to expand treatment decisions beyond fluorescein angiography (FA) data, that result in better vision outcomes.

Methods: PHP is a new method for macular metamorphopsia measurement, based on the hyperacuity phenomenon. A dotted line is flashed on a computer screen and perceived distortion or scotoma are recorded and automatically analyzed. A macular map is obtained with quantitative values of the area and intensity of the metamorphopsia. Four consecutive patients with neovascular Age-related Macular Degeneration (AMD) and one patient with CNV secondary to pathologic myopia participated in this pilot study. All patients were examined one day before PDT and 3 months following treatment.

Results: Four of the 5 patients showed a 40-80% decrease in the size of the metamorphopsia field defect at the 3-month evaluation. A similar decrease in intensity was seen in these 4 patients. Of the 4 patients showing a decrease, 2 maintained their pre-treatment visual acuity, 1 improved their visual acuity by one line, and 1 had their visual acuity deteriorate by one line. All 4 patients showed less leakage in their FA. The 5th patient had a significantly larger defect at 3 months compared to the pre-treatment baseline.

Conclusions: An objective and quantifiable means for assessing metamorphopsia following PDT may be a useful tool to evaluate the activity of the CNV, helping to better determine the timing and need for re-treatment. Validation of these results are needed with a larger population and for a longer follow-up period.