

Detection of new neovascular AMD in at-risk eyes using a handheld radial shape discrimination test in a clinical population

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Purpose: Radial Shape Discrimination testing (Wang et al, 2013, IOVS 54:5479) has shown potential for the early detection of neovascular age-related macular degeneration (nAMD). We present here an interim analysis of data from the EDiMaD study, in which we are investigating the performance of a handheld RSD test (hRSD) in a large group of at-risk patients.

Methods: We recruited 99 patients from a local clinical service (mean±SD age: 81±6 years; range: 52-95 years, 67 female) with nAMD in one eye (for which they were being treated) and no evidence of nAMD in their fellow eye (study eye, SE); SE baseline visual acuity was 82±6 letters. Patients completed the hRSD test (a 3AFC radial shape discrimination, presented on an Apple Ipad Touch) with both eyes on consecutive clinic visits from recruitment until they had been tested a maximum of 12 times, or were diagnosed with nAMD in the SE. Diagnosis was based on masked clinician assessment using biomicroscopy and spectral domain OCT, confirmed with fluorescein angiography.

Results: During follow-up, 14/99 patients converted to nAMD (group C) in the SE. Baseline VA and hRSD threshold did not differ between groups (VA C:80±8; nonC:82±6 letters; t=0.8, p=0.4; hRSD C:-0.51±0.16; nonC: -0.56±0.17 logMAR; t=0.9, p=0.4). Mean hRSD threshold at conversion was -0.40±0.17logMAR (significantly different to the average of five consecutive hRSD thresholds in the nonC group, -0.57±0.14logMAR; t=3.6, p=0.001). The area under the ROC curve (AUC) for the hRSD test was 0.78 (95%CI 0.66 to 0.91), significantly different from an AUC of 0.5 (p=0.001; for comparison the AUC for VA was 0.23). At an hRSD cut-off value of -0.48logMAR, test sensitivity was 71% for a specificity of 72%.

Conclusions: The hRSD test demonstrated sensitivity for detecting the development of nAMD superior to that reported for time domain OCT, Amsler grid and PHP hyperacuity by Do et al, 2012, Ophthalmology 119:771, who used a similar prospective study design, following the fellow eyes of patients being treated for nAMD in the first eye. Given these data, ease of test use and relatively low cost, the hRSD test may have value in the early detection of nAMD allowing earlier detection and treatment.

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