Stability of performance of a handheld radial shape discrimination test in patients at risk of developing neovascular AMD

Noelia Pitrelli Vazquez[1], Simon Harding[1], Heinrich Heimann[2], Paul C. Knox[1]

[1]Department of Eye and Vision Science, University of Liverpool, UK; [2]St Pauls Eye Unit, Royal Liverpool University Hospital, Liverpool, UK

Purpose: We are currently investigating a handheld Radial Shape Discrimination (hRSD) test (Wang et al, 2013, IOVS 54:5497) as a potential screening test for detecting new neovascular age-related macular degeneration (nvAMD). The stability of performance of the hRSD test over time was assessed in patients at risk of developing nvAMD prior to disease development.

Methods: Thirty-three non-diabetic participants (mean±SD age: 77±7 years; range: 60-91 years, 19 female) were recruited from a UK AMD clinic. Participants had nvAMD in one eye (for which they were receiving treatment) and no evidence of nvAMD in their fellow eye (study eye, SE) with a visual acuity of 0.4 logMAR or better in that eye. They performed the hRSD test with the SE, under supervision, on 5 occasions over a period of 5.5±0.8 months. Presence or absence of large drusen (maximum vertical diameter larger than 70µm) and disruption of the ellipsoid zone (EZ) within 1500µm of the centre of the fovea was assessed on Heidelberg Spectralis OCT at baseline.

Results: Group mean (±SD) hRSD thresholds at each time point were -0.54±0.18, -0.57±0.17, -0.56±0.17, -0.56±0.18 and -0.59±0.22 logMAR. A repeated measures ANOVA demonstrated that these thresholds were not statistically significantly different [$F(4, 116)=0.56$, $p=0.694$]. Regression analysis of threshold over time showed that the mean slope of individual regression lines was -0.000252±0.001206. The mean (95%CI) difference in hRSD threshold between the first and the last time points was -0.05 (-0.13 to 0.03) logMAR. Presence/absence of large drusen, or disruption to the EZ had no statistically significant effect on hRSD test performance ($p=0.10$ and $p=0.23$ respectively).

Conclusion: Stability over time prior to the development of the target pathology is an important aspect of a diagnostic test. We have confirmed that hRSD test performance was stable over a period of approximately six months in the fellow (non-nvAMD) eyes of AMD patients and that it remained consistently below the cut-off value for the hRSD test previously suggested to be indicative of disease (-0.37 logMAR).

Citation: Pitrelli Vazquez N, Harding S, Heimann H, Knox PC (2015) Stability of performance of a handheld radial shape discrimination test in patients at risk of developing neovascular AMD Investigative Ophthalmology & Visual Science 56:2220.