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MACUSTAR cross-sectional data: Repeatability and discriminatory power of visual function tests

Hannah M P Dunbar; Charlotte Behning; Deanna J Taylor; Bethany Elora Higgins; Giovanni Montesano; Alison Binns; Jan Henrik Terheyden; Amina Abdirahman; Nadia Zakaria; Stephen Poor; Gary S Rubin; Matthias Schmid; David P. Crabb; Ulrich F O Luhmann

Author Affiliations & Notes

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- ○ MACUSTAR cross-sectional data: Repeatability and discriminatory power of visual function tests

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Abstract

Purpose : To examine the repeatability of a visual function (VF) test battery and its power to discriminate between structurally defined age-related macular degeneration (AMD) stages.

Methods : Subjects with no AMD and Beckman defined early(e), intermediate(i) and late(l) AMD were recruited across 18 European study sites. All subjects performed a VF battery at day 0 and 14 ± 7 comprising chart-based [Best-Corrected Visual Acuity (BCVA), Low Luminance Visual Acuity (LLVA), Moorfields Acuity Test (MAT), Pelli Robson Contrast Sensitivity (CS) and International Reading Speed Test (IReST); and novel tests [Mesopic

(MesAT) and Scotopic (ScoAT) average thresholds by S-MAIA microperimetry and AdaptDx Rod Intercept Time (RIT)]. Repeatability of all measures was assessed by Intraclass Correlation Coefficients (ICC). Discriminant ability to distinguish between those with and without AMD and between neighbouring disease severity states was evaluated using Receiver Operator Characteristic (ROC) analyses, reporting Area Under the Curve (AUC) and partial (pAUC) at 80% specificity. Here we report the ability to distinguish between no AMD and iAMD.

Results : 301 subjects were recruited. 290 completed both visits [eAMD (n=28), iAMD (n = 167), IAMD (n=41) and no AMD (n=54)]. The cohort was roughly 2/3rd female (62.1%) with a mean age of 71. Repeatability was higher for chart-based than novel tests, with chart-based ICCs ranging from 0.88 (CS) to 0.96 (BCVA), whereas novel test ICCs ranged between 0.27 (RIT) and 0.93 (ScoAT) when all cases were considered and 0.73 (RIT) and 0.93 (ScoAT) when 3 extrapolated RIT values were removed. Discriminatory power of chart-based tests between no AMD and iAMD was moderate with AUCs of between 0.57 (IReST, pAUC = 0.04) and 0.77 (CS, pAUC = 0.08). Considering novel tests, discriminatory ability of microperimetry between no AMD and iAMD was moderate, and higher for scotopic testing (MesAT: AUC = 0.67; pAUC = 0.05; ScoAT: AUC = 0.70; pAUC = 0.06), whereas RIT values were slightly better, particularly when pAUCs were considered (RIT: AUC = 0.71; pAUC = 0.09).

Conclusions : Though CS, MesAT, ScoAT and RIT demonstrate moderate discriminatory power between no AMD and iAMD, a sizable proportion of iAMD subjects had normal VF. Given the substantial phenotypic variation in structurally defined iAMD, subgroup analyses are required to identify those with poorest VF and potential structural correlates.

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