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A COMPARISON OF RELATIVE DIAGNOSTIC PRECISION BETWEEN THE COMPASS FUNDUS PERIMETER AND THE HUMPHREY FIELD ANALYZER

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Purpose: To evaluate relative diagnostic precision of the Compass (CMP, CenterVue, Italy) fundus perimeter and the Humphrey Field Analyzer (HFA, Zeiss, Dublin) in detecting glaucomatous optic neuropathy (GON).

Methods: One eye of 498 glaucoma patients and 436 age similar normals was tested with the index tests: HFA (SITA-Standard strategy) and CMP (ZEST strategy) with a 24-2 grid. The reference test for GON was specialist evaluation of fundus photographs or OCT, independent of the visual field. For both devices, linear regression was used to calculate normal age-related sensitivity decrease to compute pointwise Total Deviation (TD) values and Mean Deviation (MD). We derived 5% and 1% pointwise age-corrected normative limits. MD and the total number of TD values below the 5% (TD5%) or the 1% (TD1%) limit per field were used as classifiers for ROC curves and partial Area Under the Curve (pAUC) to compare the diagnostic precision of the devices. Additionally, 44 glaucoma and 54 normal subjects were tested twice on both instruments. Pointwise Mean Absolute Deviation (MAD) and Bland-Altman plots for the mean sensitivity (MS) were computed. Results are reported as mean difference ± standard error.

Results: Both devices showed similar discriminative power (Figure 1). Differences between pAUC were negligible (for MD 0.019, p = 0.03; for TD5% 0.012, p = 0.023; for TD1% 0.003, p-value = 0.54). The 95% limits of agreement for the MS were reduced by 14% in CMP compared to HFA in glaucoma subjects, and by 49% in normal subjects (Figure 2). MAD was very similar, being slightly smaller (not significant) in CMP compared to HFA for glaucoma (0.03 ± 0.2 dB) and for normals (0.08 ± 0.16 dB). Average MS was lower with CMP than with HFA for glaucoma (-1.45 ± 0.01 dB) and normal subjects (-1.82 ± 0.11 dB).

Conclusions: Relative diagnostic precision of the two devices is equivalent. Test-retest variability of MS for CMP was better than HFA.
Figure 1. pROC curves for MD, TD5% and TD1% for HFA (red) and CMP (blue). Shaded regions represent 95% CIs.

Figure 2. Bland-Altman plots for HFA (red) and CMP (blue) with 95% limits of agreement (shaded) and mean difference (solid line).

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