Purpose

To compare scanning laser polarimetry GDx (Carl Zeiss Meditec Inc.) with variable corneal compensation (VCC) vs enhanced corneal compensation (ECC) (fig.1) and to correlate GDx structural data with functional data of Standard Automated Perimetry (SAP).

Methods

339 eyes of 182 patients (tab. 1) were included and screened by the glaucoma unit of the University Eye Clinic of Pavia (Italy). Patients were submitted to complete ophthalmic examination, standard automated perimetry (SAP), scanning laser polarimetry with GDx-VCC and GDx-ECC. Quality image (Q), typical scan score (TSS), nerve fibers index (NFI), nerve fibers layer average thickness in a band around the optic nerve head (TSNIT average) and in the upper (TSNIT sup) and lower sector (TSNIT inf) provided by VCC and ECC were taken into account and compared using Wilcoxon signed-rank test. Correlation between GDx and perimetric global indexes MD, PSD and Glaucoma Staging System 2 was evaluated with Pearson correlation index (r).

The same statistics were applied to a smaller group of 118 eyes characterized by a scanning laser polarimetry of optimal quality (Q>7 and TSS>80 with VCC and ECC).

Results

ECC provides better quality images than VCC: 204 images out of 339 (60%) were of good quality (Q>7) with VCC and 325 out of 339 (96%) with ECC (fig. 2). 140 images out of 339 (41%) were atypical (TSS<80) with VCC but only 20 out of 339 with ECC (6%) (fig. 3). In both groups ECC vs VCC constantly displays lower TSNIT thickness and higher NFI (tab. 1) and structure/function correlation was only poor to moderate, better for ECC parameters and above all for NFI. In the selected group of 118 patients the difference ECC/VCC reduces and there is an increase of structure/function correlation for VCC parameters particularly for TSNIT inferior and average.

Conclusions

ECC provides better quality images than VCC and probably reproduces a more reliable RNFL structure model than VCC. ECC points out lower RNFL thickness and higher NFI and reveals a better correlation to perimetric indexes as compared to VCC. GDx-ECC could improve early glaucoma diagnosis. Considering a poor to moderate structure/function correlation even with GDx-ECC, a correct diagnosis of glaucomatous optic neuropathy requires an evaluation of structure and function of the optic nerve.