DEFECTS IN MACULAR–RETINAL LAYER ANALYSIS OF GLAUCOMA PATIENTS COMPARED TO NORMATIVE DATABASE

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Purpose:
Fast scanning high-resolution optical coherence tomography (HR–OCT) enables a quantitative analysis of the topographic distribution of pathologic thinning of specific macular retinal layers in glaucoma patients.

Methods:
All subjects underwent extensive ophthalmic examination including visual field test (10°-2 and 30°-2 or 24°-2), Scanning Laser Polarimetry (GDx VCC® and ECC®, Carl Zeiss Meditec) and Scanning Laser Ophthalmoscopy (HRT3®, Heidelberg Engineering GmbH). Macular 3D-scans were recorded with HR–OCT (Cirrus®, Carl Zeiss Meditec). The macular retinal layers, especially the retinal nerve fiber layer (RNFL) and the retinal ganglion cell plus inner plexiform layer (RGIPL), were automatically segmented with a custom made software (Matlab R2009b®, The Mathworks Inc.). For further evaluation, the central 5 segments for all of the analyzed retinal layers. In most of the cases those segments were clustered. Further studies including larger numbers of patients to confirm our findings are advisable.

Results:
On average the glaucoma patients showed for RNFL, RGIPL and retina 30.9, 48.2 and 50.1 pathologic segments per patient was 6, 22 and 27.

Conclusions:
In our study quantitative analysis of retinal layer thickness based on macular HR–OCT showed a decrease of RNFL, RGIPL and retinal thickness in glaucoma patients. It has to be mentioned that our patients had on average moderately advanced glaucoma, but were distributed across the whole spectrum of the disease. Within our sample all patients had several pathologic segments for all of the analyzed retinal layers. In most of the cases those segments were clustered. Further studies including larger numbers of patients to confirm our findings are advisable.

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