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Diagnosis and monitoring of Parkinson's disease (PD) looking in the patients' eyes

Susanne Buechner[1], D. De Blasio[2]

[1]Department of Neurology, General Hospital of Bolzano, Bolzano, Italy
[2]Orthoptic Service, General Hospital of Bolzano, Bolzano, Italy

Introduction: Parkinson's disease (PD) can be divided into preclinical, prodromal, and clinical PD. Although disease-modifying treatments are still lacking, early diagnosis of PD has become of huge interest and several prodromal markers have been identified. Retinal abnormalities are seen in many PD patients, therefore some authors propose the retina as a biomarker for diagnosis and monitoring of PD. The human retinal structure can be assessed non-invasively by optical coherence tomography (OCT).

Objectives: OCT studies in PD patients reported in literature have provided conflicting results, therefore we wanted to investigate retinal morphology in some PD patients by ourselves.

Methods: 20 subjects diagnosed with PD, subdivided in 2 groups (A and B) according to their Hoehn and Yahr (H&Y) stage (I and II) and 10 age-matched control subjects underwent OCT, assessing the thickness of retinal nerve fiber layer (RNFL), ganglion cell layer (GCL), internal plexiform layer (IPL) and inner nuclear layer (INL).

Results: RNFL around the optic nerve showed an increased thickness in several quadrants in PD patients in comparison with the healthy controls, especially in the group A. Also the macular thickness resulted thicker in PD patients as well as the thickness of some singularly layers.

Conclusions: While many studies have documented thinning of the various retinal layers (RNFL, GCL, IPL, and INL) in PD patients when comparing with healthy subjects, our study has demonstrated mostly increased thickness profiles. The small group of subjects is surely a limitation of our study, however, the discrepancy between previously published data and our findings underlines the need for further studies if the retina might be considered as a biomarker in PD. Those studies should be characterized by standardized OCT techniques, include PD patients of all H&Y stages, and consider additional ophthalmological investigations.