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Could peripapillary choroidal thickness analysis with swept source OCT useful for the diagnosis of glaucoma

José Manuel Larrosa
Miguel Servet University Hospital, Spain

Purpose: The purpose is to study peripapillary choroidal thickness (PPCT) in a wide area around the optic disc and established different zones in healthy subjects using a new swept source optical coherence tomography (SS-OCT) device. To evaluate PPCT differences between primary open-angle glaucoma (POAG) patients and age and sex marked healthy controls.

Methods: A total of 246 subjects were consecutively recruited: 111 healthy subjects and 135 glaucoma patients. The group of healthy subjects was divided in two populations: the teaching population (composed by 25 controls and used to establish choroidal zones) and the validating population (composed by 86 controls and used to compare measurements with POAG patients). An optic disc 6.0×6.0 mm three dimensions scan was obtained using deep range imaging (DRI) OCT Triton. A 26×26 cube-grid centered in the optic disc is generated to automatically measure choroidal thickness. Four choroidal zones were established and used to compare peripapillary choroid between healthy and POAG patients.

Results: PPCT was significantly thinner in zone 3 of POAG group, mainly located in the superior, temporal and nasal peripapillary choroid (p=0.038); and Zone 4, corresponding to the superior area, farthest from the optic disc (p=0.023). Choroid followed a similar pattern in controls and POAG; it was thicker in superior region, followed by temporal, nasal and inferior region.

Conclusions: Glaucoma patients present peripapillary choroidal thinning compared with healthy subjects, especially in farther areas from the optic disc. Peripapillary choroidal tissue shows a concentric pattern, increasing thickness as you move away from the optic nerve. The new SS-OCT could be a useful tool to evaluate choroidal thinning and its applications in clinical practice.

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