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Foveal choroidal thicknesses in strabismic amblyopia

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Statement of the Problem: Finding new parameters could be important for earlier diagnosis and follow-up of amblyopia, a visual condition that actually seems to have not much objectively measurable prognostic factors. There's a relationship between fixation eccentricity and visual acuity (VA). In recent studies amblyopic eyes compared to normal shown an increase in central choroidal thicknesses measured by optical coherence tomography (OCT). We evaluated through OCT how foveal choroidal thicknesses (CT) correlates with strabismic amblyopia.

Methodology: 15 patients (mean age 5.4 ± 1.9) including seven cases with strabismic amblyopia and eight controls with non-strabismic amblyopia were recruited. Amblyopic eye CT was measured in nine points of the foveal region within a fixed topographic map: in center-fovea (CF) and in four cardinal points respectively at 1.5 mm and at 3 mm from CF. Thicknesses in topographic map was matched within two groups and maximum CT was reported. Three eccentricity patterns based on the distance from CF and maximum CT site were identified: first was in CF, second at 1.5 mm and third at 3 mm from CF. To each amblyopic eye a specific eccentricity pattern was attributed and compared between two groups. Subsequently, affected group eccentricity patterns were matched with the strabismic deviation degree. Finally, amblyopic eyes VA were correlated with the corresponding central CT for both groups. No statistically significant difference between groups was found in 9 CT topographic points. Instead maximum CT eccentricity differed statistically between two groups ($p < 0.05$). No correlation between degree of eccentricity and strabismic deviation was found. Furthermore, there was a weak negative correlation between center-foveal CT and depth of amblyopia as VA in controls.

Conclusions: These results suggest correlations between CT and amblyopia degree and probably between eccentricity of maximum foveal CT and VA. Our data encourage looking into analyzed parameters as possible prognostic indicators for anti-amblyopic rehabilitation.

Recent Publications

1. Read S A, Collins M J, Vincent S J and Alonso-Caneiro D (2013) Choroidal thickness in childhood. *Investigative Ophthalmology and Visual Science* 54(5):3586-93.
2. Nishi T, Ueda T, Hasegawa T, Miyata K and Ogata N (2014) Choroidal thickness in children with hyperopic anisometropic amblyopia. *Br J Ophthalmol.* 98:228-232.
3. Dickmann A, Petroni S, Perrotta V, Parrilla R, Aliberti S, Salerni A and Savastano M C (2012) Measurement of retinal nerve fiber layer thickness, macular thickness, and foveal volume in amblyopic eyes using spectral-domain optical coherence tomography *JAAPOS* 16:86-88.
4. S A Yassin, E R Al-Tamimi and S Al-Hassan (2015) Macular and retinal nerve fiber thickness in recovered and persistent amblyopia. *Int. Ophthalmol.* 1-10.
5. Rajavi Zhale et al. (2014) Macular thickness and amblyopia. *Journal of Ophthalmic and Vision Research* 9(4):478-483.

Biography

Fernando O Avellis is a Pediatric Ophthalmologist, focused his expertise in finding new measurable parameters useful in order to improve screening, early diagnosis and rehabilitation of childhood visual performance alterations. Particular emphasis is placed on new digital technologies, in particular those designed to achieve applications in low vision. One of fields of his research activity regards the identification of anatomical macular aspects typical of eyes affected by visual impairment at optic coherence tomography with the intent of using for future development of rehabilitation tools. He tries to create these models along with more than 10 years of experience spent in research, evaluation, teaching and administration in Pediatric Ophthalmology Service of University Hospital of Parma, Italy.

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