

UK Paediatric Glaucoma Society (UKPGS) Annual Meeting
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Approved CPD 6 points (Royal College of Ophthalmologists)

Abstracts

7 - Clinical significance of structural changes in the peripapillary retinal nerve fibre layer and optic nerve head in childhood glaucoma imaged using hand-held optical coherence tomography

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Purpose: To document three-dimensional changes in peripapillary retinal nerve fibre layer (ppRNFL) thickness and optic nerve head parameters in paediatric glaucoma, using hand-held optical coherence tomography (HH-OCT) and to investigate how well these changes predict visual acuity.

Methods: All participants were imaged using HH-OCT and visual acuity was measured at the same visit. Automated segmentation software was used to derive ppRNFL thicknesses in four quadrants (at a 6° radius) as well as optic nerve head parameters. Linear mixed models were used to compare OCT parameters between groups and their relationship to visual acuity.

Results: From 103 paediatric glaucoma patients, we successfully imaged 31 children with primary glaucoma and 46 with secondary glaucoma (mean age: 6.66±4.3 years). Seventy-seven age- and gender-matched controls were also imaged for comparison. In glaucoma, ppRNFL thickness was significantly thinner for all quadrants compared to controls, with the largest changes occurring in the inferior (27-33%) and superior (29-35%) quadrants. The disc area was similar in all three groups. The cup area was 102% and 158% larger and rim area 36% and 39% smaller, in primary and secondary glaucoma, respectively. There were no significant differences in OCT measurements between primary and secondary glaucoma. Visual acuity was most strongly correlated with inferior and superior ppRNFL quadrants as well as cup depth, cup-to-disc ratio, cup area and volume, rim area and volume.

Conclusion: We demonstrate the feasibility of using hand-held OCT in a paediatric glaucoma clinic to document important indicators of glaucoma severity that are associated with reduced visual acuity.