Abstracts

6 - Feasibility, reliability and optimisation of hand-held optical coherence tomography for 3-dimensional analysis of the circumpapillary retinal nerve fibre layer in young children with glaucoma

Miss Sonal Shah
Haq A, Toufeeq S, Tu Z, Edawaji B, Abbott J, Gottlob I, Proudlock F
University of Leicester, Leicester, UK and Birmingham Children's Hospital, Birmingham, UK
Correspondence: sonal-shah@live.co.uk

Purpose: To investigate feasibility and reliability of 3-dimensional optic coherence tomography, circumpapillary retinal nerve fibre layer (cpRNFL) analysis in children, with and without glaucoma, to recommend an optimal protocol for informative clinical data.
Methods: A cohort of paediatric glaucoma patients and normal children were imaged with hand-held optical coherence tomography to assess the feasibility of obtaining full cpRNFL. Two consecutive scans were acquired in a smaller sample to investigate test–retest repeatability and inter-assessor reproducibility. The cpRNFL thickness was assessed in four quadrants, at several visual angles from the optic nerve centre.
Results: Scanning was attempted in both eyes of 90 children with paediatric glaucoma and 180 controls to investigate feasibility (mean age, 6.98±4.42 years). Scanning was not possible in 68 eyes of glaucoma children mainly owing to nystagmus, unclear optical media, or high refractive errors. Where three-dimensional imaging was possible, success at obtaining full cpRNFL was possible in 67% of children with glaucoma and 89% of controls. Seventeen children with paediatric glaucoma and 34 controls contributed to reliability analysis (mean age, 6.3±3.63 years). For repeatability intraclass correlation coefficients across quadrants ranged from 0.63 to 0.82 at 4° and improved to 0.88 to 0.94 at 6°. Intraclass correlation coefficients for reproducibility were also highest at 6° (>0.97 across all quadrants).
Conclusions: We demonstrate that acquisition and measurement of cpRNFL thickness values using 3-dimensional hand-held optical coherence tomography volumes in awake children is both feasible and reliable and is optimal at 6° from the optic nerve centre.