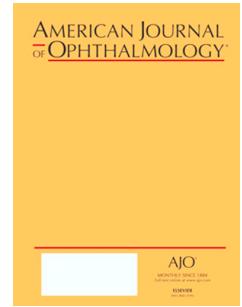


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Longitudinal Change of Circumpapillary Retinal Nerve Fiber Layer Thickness in Children with Optic Pathway Gliomas

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Abstract

Purpose: To evaluate longitudinal changes in circumpapillary retinal nerve fiber layer (RNFL) thickness, as measured by spectral-domain optical coherence tomography (SD-OCT), in children with optic pathway gliomas.

Design: Longitudinal cohort study

Methods: Global and quadrant specific circumpapillary RNFL thickness measures were acquired using either a hand-held during sedation or a table-top SD-OCT in children old enough to cooperate. Vision loss was defined as either a 0.2 logMAR decline in visual acuity, or progression of visual field. Percent change in circumpapillary RNFL thickness in eyes experiencing vision loss was compared to eyes with stable vision.

Results: Fifty-five eyes completed two-hundred fifty study visits. Ten eyes (18%) from 7 patients experienced a new episode of vision loss during the study and 45 (82%) eyes from 39 patients demonstrated stable vision across study visits. Percent decline of RNFL thickness between the baseline visit and first event of vision loss event was greatest in the superior (-14%) and inferior (-10%) quadrants as well as global average (-13%). Using a threshold of $\geq 10\%$ decline in RNFL, the positive and negative predictive value for vision loss when two or more anatomic sectors were affected was 100% and 94%, respectively.

Conclusions: Children experiencing vision loss from their optic pathway gliomas frequently demonstrate a $\geq 10\%$ decline of RNFL thickness in one or more anatomic sectors. Global average and the inferior quadrant demonstrated the best positive and negative predictive values. Circumpapillary RNFL is a surrogate marker of vision and could be helpful in making treatment decisions for children with optic pathway gliomas.

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