

Importance of Normal Aging in Estimating the Rate of Glaucomatous Neuroretinal Rim and Retinal Nerve Fiber Layer Loss

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PURPOSE: To describe longitudinal rates of change of neuroretinal parameters in patients with glaucoma and healthy controls, and to evaluate the influence of covariates.

DESIGN: Prospective longitudinal study.

PARTICIPANTS: Treated patients with glaucoma (n = 192) and healthy controls (n = 37) .

METHODS: Global disc margin-based neuroretinal rim area (DMRA) was measured with confocal scanning laser tomography, while Bruch's membrane opening-minimum rim width (BMO-MRW) , BMO area (BMOA) , and peripapillary retinal nerve fiber layer thickness (RNFLT) were measured with optical coherence tomography at 6-month intervals. Individual rates of change were estimated with ordinary least-squares regression, and linear mixed effects modeling was used to estimate the average rate of change and differences between the groups, and to evaluate the effects of baseline measurement and baseline age on rates of change.

MAIN OUTCOME MEASURES: Rates of change for each parameter.

RESULTS: Subjects were followed for a median (range) of 4 (2-6) years. The proportion of controls who had significant reduction of neuroretinal parameters was 35% for BMO-MRW, 31% for RNFLT, and 11% for DMRA. The corresponding figures for patients with glaucoma were not statistically different (42%, P = 0.45; 31%, P = 0.99; 14%, P = 0.99, respectively) . Controls had a significant reduction of BMO-MRW (mean: -1.92 $\mu\text{m}/\text{year}$, P < 0.05). **CONCLUSIONS:** Age-related loss of neuroretinal parameters may explain a large proportion of the deterioration observed in treated patients with glaucoma and should be carefully considered in estimating rates of change.

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