

Trans-lamina cribrosa pressure difference correlated with neuroretinal rim area in glaucoma

Ren R, Wang N, Zhang X, Cui T, Jonas JB

Beijing Institute of Ophthalmology, Beijing Tongren Eye Center, Beijing Tongren Hospital, Capital Medical University, Beijing, China

BACKGROUND: The aim of this work is to prospectively assess the relationship between trans-laminar cribrosa pressure difference and neuroretinal rim area as morphologic surrogate of glaucomatous optic nerve damage.

METHODS: The study included 22 patients with high-pressure glaucoma, 13 patients with normal-pressure glaucoma, and 17 subjects with ocular hypertension. All participants underwent a standardized ophthalmologic examination including confocal laser scanning tomography of the optic nerve head and computerized perimetry and a neurologic examination including measurement of the lumbar cerebrospinal fluid (CSF) pressure. The trans-lamina cribrosa pressure difference was calculated as difference of intraocular pressure minus lumbar CSF pressure.

RESULTS: Neuroretinal rim area ($p = 0.006$; correlation coefficient $r = -0.38$) and mean visual field defect ($p = 0.008$; $r = 0.38$) were significantly associated with trans-lamina cribrosa pressure difference. The probability of error was lower (i.e., the p value were lower) and the correlation coefficients were higher for the associations between rim area/visual field defect with trans-lamina cribrosa pressure difference than for the associations between rim area/visual field defect and intraocular pressure or lumbar CSF pressure.

CONCLUSIONS: The trans-lamina cribrosa pressure difference as the difference of intraocular pressure minus the lumbar CSF pressure was the main pressure parameter associated with the amount of glaucomatous optic nerve damage. This may suggest that the CSF pressure as trans-lamina cribrosa counter pressure against the intraocular pressure may play some role in the pathogenesis of glaucomatous optic neuropathy.

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