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Optic nerve sheath diameter as a potential biomarker of disease activity in idiopathic intracranial hypertension

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Introduction
Reliable noninvasive biomarkers of disease activity in idiopathic intracranial hypertension (IIH) are still lacking. Optic nerve sheath diameter (ONSD) measurement may reflect dynamic changes in intracranial pressure and disease activity over time.

Objective
To evaluate the potential utility of ONSD as a biomarker of disease activity in patients with IIH undergoing longitudinal follow-up.

Methods
This retrospective observational study included patients with IIH who underwent serial ONSD measurements during clinical follow-up. Mean bilateral ONSD values were calculated using measurements from both eyes. ONSD ≥5.5 mm was considered abnormal. Clinical, therapeutic, and ophthalmologic data were collected from medical records. Longitudinal analyses evaluated changes in ONSD over time and their association with acetazolamide treatment.

Results
Among patients with repeated ONSD evaluations, 10 presented enlarged ONSD on the first assessment, while 8 remained abnormal on the second assessment. Mean interval between evaluations was 52.4 days. Mean ONSD decreased from 6.07 mm at baseline to 5.75 mm at follow-up, demonstrating a trend toward improvement, although without statistical significance (Wilcoxon p=0.219). Mean acetazolamide dose was 2027.8 mg/day at baseline and 1964.3 mg/day at follow-up. No significant association was observed between acetazolamide dose variation and ONSD improvement (Spearman rho=0.07; p=0.90). ONSD enlargement showed significant association with papilledema, but not with visual acuity reduction.

Conclusion
Serial ONSD measurements demonstrated longitudinal variation compatible with changes in disease activity in IIH. Although statistical significance was not reached in this pilot retrospective cohort, the observed reduction in ONSD over time and its association with papilledema support the potential role of ONSD as a noninvasive biomarker for monitoring disease activity in IIH.

Keywords:
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