

Optic Nerve Sheath Diameter for Monitoring Idiopathic Intracranial Hypertension Requires Homogeneous Study Groups and Exclusion of Confounding Factors

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LETTER TO THE EDITOR

We read with interest the article by Bozdogan *et al.*, 2023. On optic ultrasound measurements of optic nerve sheath diameter (ONSD) in 25 patients with idiopathic intracranial hypertension (IIH) performed between May 2014 and December 2015 before and after a lumbar puncture (Bozdogan *et al.*, 2023). Lumbar puncture was found to significantly reduce intraventricular pressure, which was reflected in a decrease of the ONSD (Bozdogan *et al.*, 2023). It was concluded that optic ultrasound can be used to monitor IIH patients (Bozdogan *et al.*, 2023). The study is excellent but has limitations that should be discussed.

A limitation of the study is that the time point at which ONSD measurements were taken was not specified (Bozdogan *et al.*, 2023). Since CSF production is subject to diurnal fluctuations (Steffensen, A. B., 2023), the intraventricular pressures and thus ONSD can depend strongly on the time of day at which the ultrasound measurements were carried out. Therefore, it is important that the ONSD measurements were all taken at the same time of day.

A second limitation is that patients with cerebrovascular events were not excluded from the control group (Bozdogan *et al.*, 2023). Venous sinus thrombosis (VST) is also a cerebrovascular event. Because VST can be complicated by increased intracranial pressures and papilledema (Pasricha, Sachin V., *et al.*, 2023) it is imperative that these patients were not included in the control group. Another argument for excluding patients with VST from the control group is that stenting performed in cerebral veins has been shown to be

beneficial for patients with IIH (Gorjian, M. *et al.*, 2023).

A third limitation is that the CSF volume drained was not standardised (“approximately 15-20ml”). Different CSF volumes can lead to increased inter-individual heterogeneity and thus to increased standard deviations of the ONSD.

A fourth limitation is that the current medication of the 25 patients was not reported. Not only drugs to lower intracranial pressure, but also other medications, such as vitamin-A, tetracyclines, lithium, steroids, contraceptives, amiodarone, or growth hormone substitution can affect intracranial pressure.

A fifth limitation is the age difference between the patient and control group (Bozdoğan, Z. *et al.*, 2023). Since intracranial pressure decreases with age (Czosnyka, M. *et al.*, 2005), it is important that the disease and control groups are of the same age.

ONSD is also dependent on the sea level at which the survey was conducted (Strapazzon, G. *et al.*, 2014). This influencing factor should be taken into account when recommending the examination for monitoring of IIH.

The study population was surveyed between 5/2014 and 12/2015 (Bozdoğan, Z. *et al.*, 2023). What is the reason why newer cases were not included?

In summary, the interesting study has limitations that put the results and their interpretation into perspective. Addressing these issues would strengthen the conclusions and could improve the status of the study. Before concluding that lumbar

puncture is beneficial for IIH patients by reducing ONSD, procedures must be standardised, the patient group homogenised, and all factors influencing intracranial pressure excluded in the patient and control groups.

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Ethical compliance statement: The authors confirm that the approval of an institutional review board or patient consent was not required for this work. We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this work is consistent with those guidelines. This article is based on previously conducted studies and does not contain any new studies with human participants or animals performed by any of the authors.

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