Phosphorylated neurofilament heavy subunit

The phosphorylated neurofilament heavy subunit (pNfH) is an axon fiber structural protein that is released into the cerebrospinal fluid (CSF) after nerve injury. Although previous studies have reported elevated CSF levels of pNfH in various neurological diseases, including amyotrophic lateral sclerosis, these levels are examined in patients with lumbar spinal stenosis by Ohya et al. for the first time.

They included consecutive patients with LSS who were undergoing myelography for preoperative evaluation. CSF samples from patients with idiopathic scoliosis were used as the controls.

Physiological measures: CSF levels of pNfH were measured using an enzyme-linked immunosorbent assay. The Zurich Claudication Questionnaire (ZCQ) and the numerical rating scale (NRS) for sciatic pain were used to assess the clinical severity of LSS, and patients were grouped into tertiles according to their symptom severity and pain grading. Axial magnetic resonance imaging was used to evaluate the morphological severity of LSS, and patients were classified into 3 groups based on their morphological grading (using the CSF/rootlet ratio).

Analysis of variance was used to examine the relationship between the CSF levels of pNfH and the severity of LSS. This work was supported by a grant from the Japanese Ministry of Health, Labour and Welfare, although there are no potential conflicts of interest to disclose.

Thirty-three patients with LSS were included (13 men and 20 women; mean age, 73.2 years; range, 58-88 years). Most patients (n = 32) were positive for pNfH in their CSF (mean, 1,344 pg/mL; range, 149-9,250 pg/mL), while all control subjects were negative for pNfH in their CSF. Regarding the association with clinical severity, patients in the third tertiles of ZCQ and NRS tended to have higher levels of pNfH compared to the other groups. There was no association between the CSF level of pNfH and the morphological severity of LSS.

This study detected elevated pNfH levels in the CSF of patients with LSS. Patients with severe clinical symptoms were more likely to exhibit high levels of pNfH. Our results indicate the potential usefulness of pNfH as a biomarker for compressive spinal disorders ¹.

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Ohya J, Chikuda H, Kato S, Hayakawa K, Oka H, Takeshita K, Tanaka S, Ogata T. Elevated Levels of Phosphorylated Neurofilament Heavy Subunit in the Cerebrospinal Fluid of Patients with Lumbar Spinal Stenosis: Preliminary Findings. Spine J. 2015 Mar 19. pii: S1529-9430(15)00265-X. doi: 10.1016/j.spinee.2015.03.013. [Epub ahead of print] PubMed PMID: 25797810.

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