

Neurofilament Light in HTLV-1 Associated Myelopathy: Evaluation of Clinical, Radiological and Immuno-virological correlations

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Background:

Neurofilament light (Nf-L) is considered a marker of neuronal damage. We aimed to study Nf-L levels and its associations in Human T-cell lymphotropic virus type 1 (HTLV-1)-associated myelopathy (HAM).

Methods:

Using the single molecule array (SIMOA, Quanterix, Billerica, MA) assay, we quantified Nf-L in serum from patients with HTLV-1 associated myelopathy (HAM), HTLV-1 asymptomatic carriers (AC) and healthy controls (HC). Log-transformed levels were compared between the groups using Dunnett's Multiple Comparison test while adjusting for age. In the subgroup of HAM patients, we determined correlation with available Nf-L levels in cerebrospinal fluid (CSF) and used Spearman correlation analyses to test for association of Nf-L serum and CSF level with clinical disability (measured by expanded disability status scale, EDSS), spinal cord atrophy (using an automatic algorithm to quantify spinal cord cross-sectional area from T1-weighted images and calculate average area in 3 regions: C2-3, C4-5, T4-T9), HTLV-1 proviral load and immunological markers from multicolor flow cytometry analysis.

Results:

The analysis included serum samples from patients with HAM (n=48), AC (n=18) and HC (n=25). After adjusting for age, mean serum Nf-L was increased only in HAM compared to HC (17.4 pg/mL 95%CI 14.4-20.8 vs. 11.47pg/mL 95%CI 8.7-15.1, p=0.04) while AC had comparable levels to HC. CSF was available in a subgroup of HAM patients (n=22) in which serum and CSF Nf-L levels were well correlated (r=0.45, p=0.04). In HAM patients, serum or CSF Nf-L were not significantly associated with clinical disability or spinal cord atrophy, nor with HTLV-1 proviral load in blood or CSF. However, an association was found between higher CSF Nf-L levels and increased CD4+ T-cell frequency in the CSF (r=0.64, p=0.006) as well as a higher CD4/CD8 ratio (r=0.58, p=0.02).

Conclusion:

Nf-L serum levels are increased in HAM patients. These levels were not associated with clinical and radiological variables in our cohort, but were correlated with CSF Nf-L levels which were associated with increased frequency of CD4+ T-cells, the predominant reservoir of HTLV-1.

Disclosure of Interest Statement:

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