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

Mina Y1, Enose-Akahata Y1, Wu T2, Clauze A1, Ngouth N1, Azodi S1, Stack E1, Dubuche T1, Ohayon J3, Cortese I3, Reich DS4, Nair G5, Jacobson S1

1Viral Immunology Section, National Institute of Neurological Disorders and Stroke, National institutes of Health, Bethesda, MD, USA
2Clinical Trials Unit, National Institute of Neurological Disorders and Stroke, National institutes of Health, Bethesda, MD, USA
3Neuroimmunology Clinic, National Institute of Neurological Disorders and Stroke, National institutes of Health, Bethesda, MD, USA
4Translational Neuroradiology Section, National Institute of Neurological Disorders and Stroke, National institutes of Health, Bethesda, MD, USA
5Quantitative MRI Core Facility, National Institute of Neurological Disorders and Stroke, National institutes of Health, Bethesda, MD, USA

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 lymphototropic 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 Dunnet’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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