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Abstracts

Articles appearing in the January 2018 issue

Neurofilament light chain predicts disease activity in relapsing-remitting MS

Objective To investigate whether serum neurofilament light chain (NF-L) and chitinase 3-like 1 (CHI3L1) predict disease activity in relapsing-remitting multiple sclerosis (RRMS).

Methods A cohort of 85 patients with RRMS were followed for 2 years (6 months without disease-modifying treatment and 18 months with interferon-β-1a [IFN-β-1a]). Expanded Disability Status Scale was scored at baseline and every 6 months thereafter. MRI was performed at baseline and monthly for 9 months and then at months 12 and 24. Serum samples were collected at baseline and months 3, 6, 12, and 24. We analyzed the serum levels of NF-L using a single-molecule array assay and CHI3L1 by ELISA and estimated the association with clinical and MRI disease activity using mixed-effects models.

Results NF-L levels were significantly higher in patients with new T1 gadolinium-enhancing lesions (37.3 pg/mL, interquartile range [IQR] 25.9–52.4) and new T2 lesions (37.3 pg/mL, IQR 25.1–48.5) compared with those without (28.0 pg/mL, IQR 21.9–36.4, β = 1.258, $p < 0.001$ and 27.7 pg/mL, IQR 21.8–35.1, β = 1.251, $p < 0.001$, respectively). NF-L levels were associated with the presence of T1 gadolinium-enhanced lesions up to 2 months before ($p < 0.001$) and 1 month after ($p = 0.009$) the time of biomarker measurement. NF-L levels fell after initiation of IFN-β-1a treatment ($p < 0.001$). Changes in CHI3L1 were not associated with clinical or MRI disease activity or IFN-β-1a treatment.

Conclusion Serum NF-L could be a promising biomarker for subclinical MRI activity and treatment response in RRMS. In clinically stable patients, serum NF-L may offer an alternative to MRI monitoring for subclinical disease activity.

NPub.org/N2/9010a

Immune response to vaccines is maintained in patients treated with dimethyl fumarate

Objective To assess, using structural image evaluation using normalization of atrophy (SIENA), the effect of teriflunomide, a once-daily oral immunomodulator, on brain volume loss (BVL) in patients with relapsing forms of multiple sclerosis (MS) enrolled in the phase 3 Teriflunomide Multiple Sclerosis Oral (TEMSO) study.

Methods TEMSO MRI scans were analyzed (study personnel masked to treatment allocation) using SIENA to assess brain volume changes between baseline and years 1 and 2 in patients treated with placebo or teriflunomide. Treatment group comparisons were made via rank analysis of covariance.

Results Data from 969 patient MRI visits were included in this analysis: 808 patients had baseline and year 1 MRI; 709 patients had baseline and year 2 MRI. Median percentage BVL from baseline to year 1 and year 2 for placebo was 0.61% and 1.29%, respectively, and for teriflunomide 14 mg, 0.39% and 0.90%, respectively. BVL was lower for teriflunomide 14 mg vs placebo at year 1 (36.9% relative reduction, $p = 0.0001$) and year 2 (30.6% relative reduction, $p = 0.0001$). Teriflunomide 7 mg was also associated with significant reduction in BVL vs placebo over the 2-year study. The significant effects of teriflunomide 14 mg on BVL were observed in both patients with and without on-study disability worsening.

Conclusions The significant reduction of BVL vs placebo over 2 years achieved with teriflunomide is consistent with its effects on delaying disability worsening and suggests a neuroprotective potential.

Classification of evidence Class II evidence shows that teriflunomide treatment significantly reduces BVL over 2 years vs placebo.

NPub.org/N2/9008a

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F. Mir, D. Lee, H. Ray, S.A. Sadiq. 2014;1:e21. doi.org/10.1212/NXI.0000000000000021

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Y. Hacohen, M. Absoud, C. Hemingway, et al. 2014;1:e2. doi.org/10.1212/NXI.0000000000000002

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A. Zekeridou, V. Lennon. 2015;2:e110. doi.org/10.1212/NXI.0000000000000110