

NfL elevation may precede clinical exacerbation

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Max abstract length: 300 words incl. headings and study support statement (current: 300 words) (use US English)

Background: Neurofilament light chains (NfL) have been shown to be highly correlated with disease activity in multiple sclerosis (MS). A MS patient participating in a study had CSF and serum biomarkers, including NfL, on a scheduled protocol, happened to have a significant exacerbation 4 weeks after biomarker sampling. There was a 3-fold increase in NfL while MRI showed no changes.

Objective: To demonstrate the utility of NfL in measuring MS activity

Methods: This is a single case from a series of 16 SPMS (secondary progressive MS) patients who had per protocol, clinical evaluation, EDSS, cranial MRI, CSF, blood sampling scheduled at baseline, 6 weeks and 28 weeks after dimethyl fumarate (DMF) was begun. There were 4 normal controls that underwent baseline evaluations only. Patients all were ages 25 to 65. EDSS scores at baseline were 3 to 6.5.

Results: One patient experienced a clinical exacerbation 4 weeks after the 6 week evaluations with ataxia causing her EDSS to increase from 3.5 to 7.0. She had been clinically stable when seen for the 6 weeks evaluations. Cranial MRI with contrast was unchanged at the 6-week evaluation. MRIs at 28 weeks and 52 weeks were unchanged. Clinically she gradually improved so that at week 24 EDSS was 5.0. Her CSF NfL levels were: 733 pg./ml at baseline, 1950 pg./ml at 6 weeks and 854 pg./ml at 24 weeks. Serum NfL levels were approximately 30 fold lower than the CSF NfL levels. Analysis was by the SIMOA method.

Conclusion: The case demonstrated an increase in NfL levels preceding a significant clinical exacerbation in a MS patient with no detected MRI change. The data warrants investigation of NfL as a biomarker to monitor MS activity in MS patients in a prospective trial.

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