

## CSF Inflammatory Biomarkers of Multiple Sclerosis Disease Activity

*In a prospective 4-year study, more of those with elevated cytokine levels had evidence of disease activity.*

Although multiple sclerosis (MS) is often considered a disease of the white matter, appreciation is growing that pathology also directly affects the cortex. Meningeal inflammatory follicles may contribute to cortical injury through cytokines and subpial demyelination (*NEJM JW Neurol* Jun 2018 and *Ann Neurol* 2018; 83:739). To examine possible correlations between grey-matter inflammation and clinical disease progression, investigators evaluated inflammatory markers in the cerebrospinal fluid (CSF) in 99 patients with treatment-naive relapsing-remitting (RR) MS and followed them prospectively on MS treatment for 4 years.

During the study, 41 patients experienced some evidence of disease activity (relapse, new lesion, or worse disability score). Those with disease activity had higher CSF cytokines at baseline, such as CXCL13, TNF, IFN $\gamma$ , and others. Cytokine levels had moderate correlation with disease activity parameters. Those with cortical lesions and cortical atrophy likewise had elevations of CSF CXCL13 and other cytokines.

### COMMENT

This is an important article for the field, with strengths being the relatively large sample size, 4 years of follow-up, and comprehensive assessment of outcomes. If the findings are validated by additional studies, elevated CSF cytokines could be an important prognostic predictor in multiple sclerosis. Future studies could look at disease activity over time according to treatment and should include additional CSF measurement times during treatment. — **Robert T. Naismith, MD**

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At the time we reviewed this paper, its publisher noted that it was not in final form and that subsequent changes might be made.