Will neurofilaments (NFL) serum levels be the gold standard for monitoring MS progression, replacing MRI? – Yes

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Cohort studies have demonstrated that several factors present at the time of the clinically isolated syndrome (CIS) predict evolution to multiple sclerosis (MS) and disability accrual. Said factors have different weights to predict these outcomes, with magnetic resonance imaging (MRI) findings representing a high impact factor. MRI indeed is the current standard to evaluate disease activity and estimate brain volume changes in MS. However, the need to repeat MRI studies to assess inflammatory activity is costly, whereas assessments of brain volume changes are difficult to standardize for use in the clinical practice and are, above all, retrospective in nature. Measuring serum neurofilament light chain (NfL) levels, on the other hand, provides real-time information of the disease process in MS at a potentially lower cost. Serum NfL has strong associations with MRI measures of inflammation and atrophy. High serum NfL levels increase the risk of presenting new or enlarging T2 lesions and of accelerated brain volume loss over 2 years. But serum NfL levels measured at baseline may also be predictive of future brain atrophy independently of inflammatory activity: whereas patients with enhancing lesions have high NfL levels, levels are still higher in MS patients without inflammatory activity compared to healthy controls. These results suggest serum NfL levels are likely an integral biomarker of disease evolution in MS. Therefore, integrating serum NfL levels into the routine clinical practice may make repeated MRIs to demonstrate disease activity or brain volume loss redundant and speed decision-making processes, such as initiating or switching treatments.