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Blood neurofilament light levels segregate treatment effects in multiple sclerosis

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Study objective and summary result

This study examined the treatment effects of several disease-modifying therapies (DMTs) on blood neurofilament light chain (NfL) levels in patients with relapsing-remitting multiple sclerosis (RRMS). The identity of a DMT is an important determinant of plasma NfL (pNfL) level changes in these patients.

What is known and what this paper adds

Past studies have shown that individual DMTs are associated with reductions in circulating NfL levels, but little research has been done comparing multiple DMTs in this regard. This investigation compares multiple DMTs in terms of their effects on pNfL levels.

Participants and setting

The investigators analyzed data from 1,261 patients with RRMS who participated in the Immunomodulation and MS Epidemiology Study and similar studies. These studies followed patients with MS in Sweden who were prescribed various DMTs, including alemtuzumab, dimethyl fumarate, fingolimod, natalizumab, and teriflunomide.

Design, size, and duration

Blood samples were collected at treatment start and during treatment. pNfL levels were quantified with an immunoassay, blinding for treatment and clinical data. Linear regression models were used to analyze pNfL levels and changes in pNfL levels as functions of the DMT prescribed. Propensity scores were used to account for baseline characteristics differences between DMT groups.

Primary outcome measures

The primary outcomes were the comparisons of the DMTs in terms of pNfL levels.

Main results and the role of chance

Both from-baseline changes in pNfL levels and on-treatment pNfL levels differed according to the DMT prescribed. Alemtuzumab was associated with the greatest from-baseline reductions in pNfL levels and the lowest on-treatment pNfL levels, whereas teriflunomide was associated with the smallest from-baseline reductions and the highest on-treatment levels.

Table From-baseline changes in log-transformed pNfL levels in weighted analyses

DMT	Exp(β) (95% confidence interval)
Teriflunomide	0.931 (0.840–1.044)
Dimethyl fumarate	0.739 (0.628–0.870)
Fingolimod	0.644 (0.547–0.758)
Natalizumab	0.671 (0.570–0.791)
Alemtuzumab	0.517 (0.440–0.608)

Abbreviations: DMT = disease-modifying therapy; pNFL = plasma neurofilament light chain.

Bias, confounding, and other reasons for caution

The present study lacked data for MRI, and other potentially relevant variables.

Generalizability to other populations

The present study's reliance on data from Sweden may limit the generalizability of the results to dissimilar countries.

Study funding/potential competing interests

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A draft of the short-form article was written by M. Dalefield, a writer with Editage, a division of Cactus Communications. The corresponding author(s) of the full-length article and the journal editors edited and approved the final version.

