

Abstract

Multiple sclerosis (MS) is a chronic, autoimmune, and neurodegenerative disorder of the central nervous system. We currently utilize clinical and paraclinical markers for several purposes: to monitor the disease status, assess the response to MS specific treatments, and predict the future disease course. The first part of this work focuses on the use of clinical markers (such as relapse rate and EDSS) to evaluate different treatment strategies for the initial therapy. At first, we compare the initiation of treatment with first-line drugs to the direct initiation of treatment with high-efficacy drugs. Additionally, we investigate the importance of promptly starting first-line treatment immediately diagnosis. By a comparison of data from the Czech and Swedish MS registries, we have demonstrated better outcomes (future relapses, improvement in EDSS) in patients in Sweden, where high-efficacy therapy is initiated directly in a significantly larger proportion of patients compared to the Czech Republic. Furthermore, we have highlighted the importance of early treatment initiation for patients with minimal EDSS and low relapse rate. The second part of this work evaluates serum neurofilament light chain (sNfL) as a promising predictive marker of future clinical and magnetic resonance imaging disease activity. In a cohort of 172 newly diagnosed patients with relapsing-remitting MS, we have confirmed that sNfL serves as a marker of the ongoing disease activity and as a predictor of future brain atrophy.

Key words: multiple sclerosis, biomarkers, neurofilament light chain, treatment strategies