

## **Abstract**

Multiple sclerosis (MS) is a chronic autoimmune disease of the central nervous system that generates a wide range of clinical symptoms. These include cognitive impairment, a set of symptoms closely associated with the quality of life, which also serves as one of the most important predictors of limited ability to work. This doctoral thesis presents the output from four studies divided into three areas focusing on neuropsychological markers in connection to other manifestations and effects of MS.

The first researched area is the link between speech characteristics and the information processing speed by patients with MS. Our study has proven a profound association between lower speed of articulation and below-average performance in terms of information processing speed. We have proven that acoustic quantitative speech analysis has the potential to identify patients with below-average cognitive performance.

Another goal of this doctoral thesis was to ascertain the predictive value of serum neurofilament light chain levels in recently diagnosed patients with MS for the development of cognitive disorder within nine years of observation. During the period of observation, we uncovered only a loose link between high levels at the onset of the disease and the deterioration of cognitive functions in relation to the domain of verbal memory.

The last observed area was the ability to work. The goal was to find out whether evaluating cognition and other clinical markers would help identify patients with a higher risk of unemployment. Another goal was to identify clinical and magnetic resonance (MR) markers of limited ability to work during the 12-year observation period. The Symbol Digit Modalities Test of the information processing speed proved to be among the strongest clinical markers of unemployment. Using a combination of clinical and MR markers improved the prediction of change in the ability to work over the period of observation.

**Key words:** multiple sclerosis, cognition, speech, articulation, neurofilament light chain, workability, longitudinal study