e-MS Experts' Summit Season 2020

Abstracts

Biomarkers in MS: neurofilament light chain in serum or plasma

Jens Kuhle (Basel, Switzerland)

Numerous inflammatory biomarkers have been evaluated in MS over recent years, including IgG and IgM oligoclonal bands, kappa-free light chains, chemokine ligand 13, matrix metalloproteinase-9, ostepontin, soluble CD27 and chitinase 3-like-1. Of these, neurofilament light chain (NfL) protein is the most advanced, with potential for clinical application.

Neuroaxonal damage is the pathological substrate of permanent disability in various neurological disorders. Reliable quantification and longitudinal follow-up of such damage are important for assessing disease activity, monitoring treatment responses, facilitating treatment development and determining prognosis. The NfL protein has promise in this context because its levels increase upon neuroaxonal damage, not only in the cerebrospinal fluid (CSF) but also in the blood, and NfL indicates neuroaxonal injury independent of causal pathways.

First-generation (immunoblot) and second-generation (enzyme-linked immunosorbent assay) NfL assays have limited sensitivity. Third-generation (electrochemiluminescence) and particularly fourth-generation (single-molecule array) assays enable the reliable measurement of NfL throughout the range of concentrations found in blood samples. This technological advancement has paved the way to investigate NfL in all stages of MS, cross-sectionally and longitudinally.[1]

During this session, what is known about the structure and function of neurofilaments will be reviewed, the analytical aspects and knowledge of the age-dependent normal ranges of NfL will be discussed and a comprehensive overview of the studies on NfL as a marker of axonal injury in MS will be provided. The work needed to explore the value of this axonal damage marker in managing MS in daily practice will also be considered.

References

1. Khalil M, Teunissen CE, Otto M, et al. *Nat Rev Neurol* 2018; 14: 577–89.