Importance of Diagnosis and Early Treatment: Subclinical Disease, Imaging & Biomarkers

Stephen C. Krieger, MD, FAAN
Associate Professor of Neurology
Corinne Goldsmith Dickinson
Center for MS
Director, Neurology Residency
Program
Icahn School of Medicine at
Mount Sinai, New York, NY

Clinical and demographic factors influence the prognosis of patients with multiple sclerosis (MS). The diagnosis of MS has continuously evolved, allowing for an earlier and more accurate diagnosis of MS over time. The McDonald Criteria for diagnosis of MS were originally proposed in 2001, with previous revisions in both 2005 and 2010. The International Panel on Diagnosis in MS have reviewed the 2010 McDonald Criteria, and made recommendations for the revised 2017 McDonald Criteria. The new 2017 revision introduces other important changes, with a further simplification for the diagnosis. Oligoclonal bands reassume a more relevant role in the workup. These new criteria may have an important impact in clinical practice with identification of subclinical disease, and an earlier treatment to avoid the risk of disease dissemination. The application requires a careful assessment to avoid misdiagnosis and mistreatments.

However, the clinical course in MS is difficult to predict on group and individual levels. Relapses and progression contribute to MS disease course, but neither the relationship between them nor the spectrum of clinical heterogeneity has been fully characterized. A topographical model of MS is a new approach to characterizing the clinical course, with the potential to personalize disability progression based on each individual patient's pattern of disease burden (e.g., lesion location) and reserve. This topographical model encapsulates 5 factors (localization of relapses and causative lesions; relapse frequency, severity, and recovery; and progression rate), visualized utilizing dynamic 3-dimensional renderings. The model uses real-time simulation software to depict disease course archetypes and illuminate several well-described but poorly reconciled phenomena including the clinical/MRI paradox and prognostic significance of lesion location and burden on disease outcomes. The dynamic clinical threshold depicted in this visual model may help clinicians to educate patients about clinical phenotype and disease burden, and foster an understanding of the difference between relapses and pseudoexacerbations. Utilization of this model could allow for earlier and more clinically precise identification of progressive MS and predictive implications can be empirically tested.

Using this topographical model of disease may aid clinicians in better identifying the individual disease course and prognosis of MS, as well as optimize treatments. These, along with new disease biomarkers (i.e., neurofilament light) will be reviewed in this presentation.