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A MULTI-MODAL NEUROPHYSIOLOGICAL EVALUATION OF PPMS

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MS is difficult to measure. Limited sensitivity of clinical measures has prohibited conducting adequately powered trials in PPMS.

Neurophysiological evaluation using EPs to evaluate long tract integrity and EEG Coherence Analysis to gauge cortical network functional connectivity may provide markers which correlate with patients' clinical status and prove sufficiently sensitive to be effective interim measures in smaller/shorter trials.

31 PPMS patients [35–70 y, m=f, EDSS 5.7 (3.5–8)] were recruited (2007–2011). 6, 12, 24 and 36 months after baseline participants underwent combined clinical assessment with EDSS, MSFC and RMI with subjective evaluation by MSQI and underwent an EP battery comprising bilateral VEP and BSAEP, with SSEPs and MEPs for all four limbs. EEG from 5 bipolar electrode pairs (Cz–Fz, O1–A1, C3–A1, O2–A2 and C4–A2) was attained for coherence based network modelling.

Normalisation of EP results generated Z scores for summation. Waveforms were also qualitatively evaluated according to the GEPS System. Cross sectional evaluation suggests good correlation between the GEPS and Summed Z with respect to clinical measures ($\rho=0.63$ $p<0.001$ GEPS vs. EDSS). The network data also suggest similar approaches may provide sensitive objective correlates of cognitive ability and fatigue burden.

Multimodal evaluation may sensitively provide meaningful measurements across many domains affected by PPMS and facilitate trials.