Publication

Preferential Spinal Cord Volume Loss in Primary Progressive Multiple Sclerosis

Little is known on longer term changes of spinal cord volume (SCV) in primary progressive multiple sclerosis (PPMS). Longitudinal evaluation of SCV loss in PPMS and its correlation to clinical outcomes, compared to relapse-onset multiple sclerosis (MS) subtypes. A total of 60 MS age-, sex- and disease duration-matched patients (12 PPMS, each 24 relapsing-remitting (RRMS) and secondary progressive MS (SPMS)) were analysed annually over 6 years of follow-up. The upper cervical SCV was measured on 3D T1-weighted magnetization-prepared rapid gradient-echo (MPRAGE) images using a semi-automatic software (CORDIAL), along with the total brain volume (TBV), brain T2 lesion volume (T2LV) and Expanded Disability Status Scale (EDSS). PPMS showed faster SCV loss over time than RRMS ($p<0.01$) and by trend ($p=0.066$) compared with SPMS. In contrast to relapse-onset MS, in PPMS SCV loss progressed independent of TBV and T2LV changes. Moreover, in PPMS, SCV was the only magnetic resonance imaging (MRI) measurement associated with EDSS increase over time ($p<0.01$), as opposed to RRMS and SPMS. SCV loss is a strong predictor of clinical outcomes in PPMS and has shown to be faster and independent of brain MRI metrics compared to relapse-onset MS.