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**Proceedings Paper:**

Doshi, A, De Angelis, F, Muhlert, N et al. (21 more authors) (2018) Multiple Sclerosis Impact Scale and brain volume are independent predictors of cognitive impairment in Secondary Progressive Multiple Sclerosis. In: European Journal of Neurology. 4th Congress of the European Academy of Neurology, 16-19 Jul 2018, Lisbon, Portugal. Wiley , pp. 69-70.

<https://doi.org/10.1111/ene.13698>

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**European Academy of Neurology (EAN), 16-19 June 2018, Lisbon, Portugal**

(abstract deadline 17<sup>th</sup> January; word limit: 250)

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**Title:**

Multiple Sclerosis Impact Scale and brain volume are independent predictors of cognitive impairment in secondary progressive multiple sclerosis.

**Background and Aims:**

Cognitive deficits in multiple sclerosis (MS) affect up to 70% of patients with progressive MS. We investigate the associations between the disease specific Multiple Sclerosis Impact Scale psychological subscale (MSIS-29v2-PSYCH), magnetic resonance image (MRI) normalised brain volume and cognitive impairment in people with secondary progressive MS(SPMS).

**Methods:**

A group of SPMS patients were recruited at baseline from a randomised phase 2 clinical trial (MS-SMART). Patients were assessed using a cognitive test battery (Table 1) to define cognitive status based on conservative criteria (standard deviation of z-score of  $-1.96$  on  $\geq 2$  tests), and completed the MSIS-29v2 questionnaire. Normalised brain volume (NBV) was measured using the geodesic information flow and SIENAX algorithms. We analysed associations of cognitive impairment with MSIS-29-v2-PSYCH subscale and brain volume using binary logistic regression (Figure 3).

### **Results:**

60 subjects were analysed with baseline characteristics shown in Table 2. We find NBV and MSIS-29v2-PSYCH to be independent predictors of cognitive impairment after adjusting for age, gender and years of education (Figure 3). There is a significant negative association between NBV and cognitive impairment (OR: 0.45; 95% CI: 0.21-0.84;  $p=0.0191$ ) and a significant positive association between MSIS-29-PSYCH and cognitive impairment (OR: 1.89; 95% CI: 1.03-3.72;  $p=0.0491$ ).

### **Conclusion:**

Baseline MSIS-29v2-PSYCH has the potential to be a predictor of cognitive impairment in a SPMS patients. Longitudinal data will confirm the role of this self-reported outcome measure as a marker of MS future cognitive status.

**Acknowledgments/source of funding:** The MS-SMART trial is a project funded by Efficacy and Mechanism Evaluation (EME) Programme, an MRC and NIHR partnership. It is also supported by the UK Multiple Sclerosis Society; the National Institute for Health Research University College London Hospitals Biomedical Research Centre and University College London; NIHR Leeds CRF (DenTCRU).

### **Disclosures:**

AD, FDA, NM, JS, AE, FP, DP, NJ, AC, SP, CH, NS, PC, SC declare no conflict of interests with respect to this work.

CJW and RP were supported in this work by NHS Lothian via the Edinburgh Clinical Trials Unit.

SO receives funding from the EPSRC (EP/H046410/1, EP/J020990/1, EP/K005278), the MRC (MR/J01107X/1), the EU-FP7 (FP7-ICT-2011-9-601055), and NIHR UCLH BRC (BW.mn.BRC10269).

DMM has received research grants from Apitope, Biogen, GlaxoSmithKline, Novartis, Richmond Pharma, and Schering AG.

GG is a steering committee member on the daclizumab trials for AbbVie, the BG12 and daclizumab trials for Biogen-Idec, the fingolimod and siponimod trials for Novartis, the laquinimod trials for Teva, and the ocrelizumab trials for Roche. He has also received consultancy fees for advisory board meetings for oral cladribine trials for Merck-Serono, Genzyme-Sanofi, and in relation to DSMB activities for Synthon BV, as well as honoraria for speaking at the Physicians' summit and several medical education meetings. He is also the co-chief editor of Multiple Sclerosis and Related Disorders (Elsevier).

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CGKW receives research grants (PI and co-applicant) from Spinal Research, Craig H. Neilsen Foundation, EPSRC, Wings for Life, UK MS Society, Horizon2020, NIHR/MRC.

JC has received support from the Efficacy and Mechanism Evaluation Programme and Health Technology Assessment Programme (NIHR); UK Multiple Sclerosis Society and National Multiple Sclerosis Society. In the last three years he has been a local principal investigator for trials in multiple sclerosis funded by: Receptos, Novartis and Biogen Idec, and has received an investigator grant from Novartis outside this work. He has taken part in Advisory Boards/consultancy for Roche, Merck, MedDay, Biogen and Apitope.

BS has received funding from NIHR and the UK MS Society, has been a principal investigator for trials in multiple sclerosis funded by: Receptos, Novartis, Biogen, Merck, Genzyme, Roche and Teva.