This is an author produced version of *Examining cross-sectional relationships of optical coherence tomography, cervical cord MRI and disability in secondary progressive MS*.

White Rose Research Online URL for this paper:
http://eprints.whiterose.ac.uk/127922/

**Proceedings Paper:**

https://doi.org/10.1177/1352458517731404

© 2017, SAGE Publications. This is an author produced version of a paper published in Multiple Sclerosis Journal. Uploaded in accordance with the publisher's self-archiving policy.
Examining cross-sectional relationships of optical coherence tomography, cervical cord MRI and disability in secondary progressive MS

ECTRIMS Online Library. de angelis f. Oct 26, 2017; 200254


Abstract: P599
Type: Poster
Abstract Category: Pathology and pathogenesis of MS - 22 OCT

Background: There is a major need to develop interim markers of disability in progressive MS. Optical coherence tomography (OCT) and spinal cord MRI (SC-MRI) have significant promise.

Aim: To assess the cross-sectional relationships of OCT, SC-MRI and clinical measures of disability in a large cohort of patients with secondary progressive MS (SPMS).

Methods: MS-SMART (NCT01910259) is an ongoing UK multi-centre, multi-arm, double-blind, placebo-controlled phase IIb randomised controlled trial that has enrolled 445 SPMS patients aged 18-65, with EDSS 4.0-6.5. An embedded single-centre study was pre-planned to assess OCT and SC-MRI. For this sub-study, we excluded patients with ocular disease, high refractive errors (> ±6.0 dpt), history of bilateral optic neuritis (ON), or possible subclinical ON (i.e. interocular OCT differences > 20%). For patients with no previous ON, we averaged the OCT measures from both eyes; with a history of unilateral ON, we only included the fellow eye with no history of ON. We collected Expanded Disability Status Scale (EDSS), Symbol Digit Modalities Test (SDMT), MS Functional Composite (MSFC), mean upper cervical cord area (MUCCA), and 3 OCT measures (peripapillary retinal nerve fibre layer [pRNFL], ganglion cell layer [GCL] volume, total macular volume [TMV]). We calculated Kendall’s tau correlation coefficients between the clinical variables, MUCCA, and OCT. Subsequently, we divided the cohort in quartiles and performed multiple linear regression analyses, with adjustment for gender, age, and disease duration.

Results: OCT data were available for 112 participants, MUCCA for 146, and both OCT and MUCCA were available for 95. EDSS was moderately correlated with MUCCA (N=146, t: -0.307, p< 0.001), but not with the three OCT measures. SDMT was weakly correlated with MUCCA (N=145, t: 0.202, p=0.015), pRNFL (N=111, t: 0.262, p< 0.001), GCL (N=112; t: 0.259, p< 0.001), and very weakly with TMV (N=112, t: 0.138 p=0.034). MSFC was moderately correlated with MUCCA (N=146, t: 0.328, p< 0.001), but not with the three OCT measures. There was no significant correlation between MUCCA and any OCT measure. Regression analyses confirmed these findings.

Conclusions: This cross-sectional analysis may suggest that MUCCA and OCT measure complementary dimensions of neurodegeneration in SPMS. Ongoing longitudinal analysis will clarify these findings.

EPSRC, Wings for Life, UK MS Society, Horizon2020, NIHR/MRC.

J.C. has support from the National Institute of Health Research (NIHR) University College London Hospitals Biomedical Research Centres funding scheme and University College London (UCL). In the last 3 years, he has attended advisory boards for Roche, Merck and Apitope. He is local principal investigator for trials in multiple sclerosis funded by Novartis, Biogen, and Receptos.

D.H.M. has received honoraria through payments to UCL Institute of Neurology, for Advisory Committee and/or Consultancy advice in multiple sclerosis studies from Novartis and Mitsubishi Pharma Europe and compensation through payments to UCL Institute of Neurology for performing central MRI analysis of a multiple sclerosis trial from Novartis.

G.G. 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).

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).