Abstract:

**Objectives:** To investigate the association between impaired color vision and disease severity in multiple sclerosis (MS).

**Methods:** We performed neurological and ophthalmic examinations, as well as MRI and OCT analyses, on 108 MS patients, both at baseline and after a follow-up of 1 year. Disability was assessed with EDSS, MSFC and BRB-N, and color vision was evaluated independently in each eye using Hardy, Rand and Rittler (HRR) plates. Using general linear models adjusted for sex, age, disease duration and treatment, we compared the adjusted means between patients with and without impaired color vision.

**Results:** Impaired color vision in non-ON eyes was detected in 21 patients at baseline. Patients with dyschromatopsia experienced greater disability than those with normal color vision, as witnessed by decreases in the MSFC score [adjusted difference: -0.25, 95%CI: -0.48 to -0.02; p=0.035] and executive function component of the BRB-N [adjusted difference: -0.55, 95%CI: -1.00 to -0.10; p=0.016]. In addition, these patients had thinner RNFL [adjusted difference: -8.72, 95%CI: -14.39 to -3.06; p=0.003], smaller macular volume [adjusted difference: -0.21, 95%CI: -0.39 to -0.03; p=0.025] and normalized brain volume [adjusted difference: -52.92, 95%CI: -92.51 to -13.33; p=0.009], as well as a non-significant decrease in normalized grey matter volume (NGMV) [adjusted difference: -22.92, 95%CI: -47.59 to 1.74; p=0.069]. Moreover, participants with incident dyschromatopsia after 1 year follow-up had a greater increase in EDSS score [adjusted difference: 0.52 95%CI: 0.21 to 0.81; p=0.001] and a greater decrease in NGMV [adjusted difference: 19.38 95%CI: 5.57 to 33.19; p=0.006] than participants with normal color vision.

**Conclusions:** Color vision impairment is associated with greater MS severity and may be used as a clinical marker of future disability.

**Biography:**

Elena H. Martínez-Lapiscina was born in 1982 in Spain. She studied Medical School at the University of Navarra from 2000 to 2006. After obtaining the top position in the national examination for accessing to a medical residency, she received her residency training for Neurology at the Navarra Hospital (2008-2012). She combined her residency program with a PhD cum laude on the effects of healthy eating on cognitive function (advisor Prof. Dr. Martínez-González and Dr. Clavero, 2010-2013). She started on 2012 a Fellowship in medical image at the Neuroimmunology center with Dr. Villoslada. Her research work is now focused on the cause and the development of biomarkers of demyelinating diseases, especially across retinal and brain image. Since then, she has recently published the suitability of retinal periphlebitis as a marker of disease severity (Neurology in press) and she contributes to the study of trans-synaptic degeneration in Multiple Sclerosis (Submitted to Annals of Neurology) and the impact of retinal molecular image by Raman Spectroscopy on inflammation assessment.