

## Abstract Preview - Step 3/4

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Topic: 20. Imaging

**Title:** Association between iron deposit within focal lesions and radiological/clinical measurements in patients with clinically isolated syndrome

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**Text:** **Background and objective:** In early stages of multiple sclerosis (MS) iron deposits may within focal T2 lesions be associated with the progression of the disease. The aim of this study is to evaluate the association between iron deposit within focal lesions and radiological and clinical measurements in patients with clinically isolated syndrome (CIS).

**Materials and methods:** 30 patients (21 women; median age, 33.5 years; EDSS range, [0, 4.5]; mean disease duration, 3.07 months) with CIS. Baseline (B) and 12 month (M12) proton density and T2-weighted, and susceptibility weighted (SW) images were acquired on a 3.0T MRI.

Iron content of lesions was measured on filtered-phase SW images as the increase with regard to white matter values in 17 healthy controls (15 women; median age, 35 years). Two regions of interest (ROI) were defined at B exam: T2 lesion mask (ROI-1), and high iron content region (ROI-2) within ROI-1. Measurements involved were: Fe increase per tissue gram in ROI-1 (iFe1B) and in ROI-2 (iFe2B) at B, number of pixels in ROI-2 (NPB) at B, number (NGdB, NGdM12) and volume (VGdB, VGdM12) of gadolinium-enhanced lesions at B and M12, brain parenchymal fraction (BPF, BPFM12) at B and M12, number (NT2B) and volume (VT2B) of T2 lesions at B, number (NNT2M12) and volume (VNT2M12) of new lesions at M12, percentage of brain volume change (PBVC) between B and M12, EDSS, and disease duration. Statistical analysis involved Spearman rank correlation to test association between iron deposits and clinical and radiological variables.

**Results:** Some associations between measurements involving iron deposits and radiological measurements were found (NPB vs. NT2B [0.840,  $p < 0.001$ ]; iFe2B vs. VT2B [0.415,  $p = 0.022$ ]; NPB vs. VT2B [0.970,  $p < 0.001$ ]; iFe1B vs. NGdB [0.405,  $p = 0.026$ ]; iFe2B vs. NGdB [0.433,  $p = 0.017$ ]; NPB vs. NGdB [0.639,  $p < 0.001$ ]; iFe1B vs. VGdB [0.430,  $p = 0.018$ ]; iFe2B vs. VGdB [0.468,  $p = 0.009$ ]; NPB vs. VGdB [0.633,  $p < 0.001$ ]; iFe1B vs. NNT2M12 [0.467,  $p = 0.009$ ]; NPB vs. NNT2M12 [0.659,  $p < 0.001$ ]; iFe1B vs. VNT2M12 [0.385,  $p = 0.035$ ]; NPB vs. VNT2M12 [0.537,  $p = 0.002$ ]; iFe2B vs. BPFM12 [-0.380,  $p = 0.038$ ]; NPB vs. BPFM12 [-0.500,  $p = 0.005$ ].

**Conclusions:** Moderate to strong associations found in this study suggest that in early stages of MS the presence of baseline iron deposits within focal T2 lesions are related to lesion load. Moreover, the presence of abnormal iron deposits also seems to be associated with new lesions and brain atrophy at month 12.

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Cristina Auger has received speaking honoraria from Novartis and Genzyme.

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Alex Rovira serves on scientific advisory boards for Biogen Idec, Novartis, Genzyme, and OLEA Medical, and has received speaker honoraria from Bayer, Genzyme, Sanofi-Aventis, Bracco, Merck-Serono, Teva Pharmaceutical Industries Ltd, OLEA Medical, Stendhal, Novartis and Biogen Idec.

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