

## **Signal abnormalities on susceptibility-weighted MR imaging in patients with clinically isolated syndromes and in subjects with incidental focal white matter lesions**

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### **ABSTRACT**

#### **Background and purpose**

To analyze the value of SWI in differentiating clinically isolated syndrome (CIS) patients, from asymptomatic or migraine young adults demonstrating incidental brain focal white matter lesions.

#### **Methods:**

32 patients with CIS, and 21 subjects demonstrating incidental brain MR imaging focal lesions (control group) (mean age 43 years, 90% females) were included in the study. One observer assessed the fulfillment of the McDonald criteria for dissemination in space (DIS), and the presence of lesions showing intralesional susceptibility signal loss (ISS) on SWI sequence. To investigate whether the presence of ISS can aid in the differential diagnosis of patients with CIS from control subjects, we conducted sensitivity, specificity, and accuracy analysis.

#### **Results:**

DIS was demonstrated in all CIS patients, while only in 14% of the control group. ISS was observed only in 4 subjects in the control group, although only one showed more than 20% of the T2 visible lesions with this signal abnormality. ISS were observed in all CIS patients (all but two with more than 20% of the T2 lesions with this signal abnormality). The presence of ISS (in at least 20% of T2 lesions) achieved a high sensitivity (93%) specificity (95%) and accuracy (94%) for differentiating CIS from controls, although similar results were obtained when considering fulfillment of DIS criteria (sensitivity 100%; specificity 86%, accuracy 94%). Combining the presence of ISS with the McDonald 2010 criteria for DIS achieved 93% of sensitivity, 100% specificity and 96% accuracy in differentiating patients with CIS from subjects with incidental white matter abnormalities.

#### **Conclusions:**

Intralesional susceptibility signal (ISS) changes on SWI, are constantly present among patients with CIS, and were highly specific in differentiating these patients from subjects showing incidental white matter abnormalities. Combination of presence of ISS loss and current McDonald criteria for DIS improves diagnostic specificity and accuracy.