Purpose: Regional brain iron amount in substantia nigra (SN) measured by MRI is a possibly reliable biomarker in diagnosis of Parkinson's disease (PD). Our objective is to testify the role and sensitivity of regional iron deposition detected by susceptibility-weighted imaging (SWI), a novel MRI technique, in PD.

Methods: Twenty-five patients with idiopathic PD and 15 control subjects were examined on a 1.5 tesla MR imager, using a three-dimensional gradient-echo sequence to obtain SWI. We established the visual scales for SWI to grade the amount of iron deposition in SN (grade 0 to 2, higher grading means more iron deposition). The diagnostic role of SWI for PD and its correlation with clinical severity were analyzed.

Results: The reproducibility of this visual scaling was excellent. For detecting PD, the sensitivity of visual scale $\geq 1$ was 24 %, specificity 86.67 %, PPV 75 %, NPV 40.63 %; the sensitivity of visual scale 2 was 16 %, specificity 100 %, PPV 100 %, NPV 41.67 %. There is a non-significant correlation between the grading of visual scales and Hoehn & Yahr (HY) staging ($p=0.054$).

Conclusion: SWI at 1.5 tesla disappointingly had a low sensitivity for detection of PD by visual inspection, but the specificity of visual scale $\geq 1$ for differentiating PD from normal subjects was good. Obtaining SWI under higher magnetic field, such as 3 tesla, might be a possible way to improve the detecting sensitivity.