GREY MATTER CORRELATIONS OF COGNITIVE IMPAIRMENT IN EARLY PARKINSON'S DISEASE: THE INCIDENCE OF COGNITIVE IMPAIRMENT IN COHORTS WITH LONGITUDINAL EVALUATION—PARKINSON'S DISEASE (ICICLE–PD) STUDY

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Introduction
Currently, there are no biomarkers capable of identifying those at greatest risk of developing Parkinson’s disease dementia (PDD). In patients with PDD, magnetic resonance imaging (MRI) demonstrates diffuse grey matter (GM) loss, however, GM loss has been reported earlier in the disease. We aimed to determine if GM atrophy was present in newly diagnosed PD and whether it was greater in those with mild cognitive impairment (PD–MCI) compared to patients with normal cognition (PD–NC).

Methods
125 newly diagnosed PD patients and 50 controls were recruited from the ICICLE–PD study. Attention, executive, memory, language and visuospatial functions were assessed. PD–MCI was determined according to Movement Disorder Society Task Force criteria. GM volume analyses were performed using SPM8 (Statistical Parametric Mapping, http://www.fil.ion.ucl.ac.uk/spm). Significant effects were assessed using a voxelwise uncorrected threshold of p≤0.001 and clusters regarded as significant if they were larger than 100 voxels with a family-wise error threshold of p≤0.05, corrected for multiple comparisons. Age and intracranial volume were included as covariates.

Results
Table 1 shows the demographic and clinical characteristics of the groups. There were no differences in age, gender or education. PD patients performed more poorly in most cognitive tests. Frequencies of impairments were: memory (17.6%), executive (13.6%), attention (10.4%), visuospatial (9.6%) and language (0%). 39.2% of patients met PD–MCI criteria. There were no areas of reduced GM volume in the PD group compared with controls. Patients classified as PD–MCI did not demonstrate reduced GM volumes compared with PD–NC or controls. There were no correlations between GM volume and cognitive testing performance.

Conclusion
GM loss is not present in newly diagnosed PD, either in patients with PD–MCI or PD–NC. These data are consistent with neuropathological studies suggesting that GM loss occurs with disease progression and is not prominent in early PD where the neurodegenerative process is more limited.