Early stage [^{123}I]β-CIT SPECT and long-term clinical follow-up in patients with an initial clinical diagnosis of Parkinson's disease

Stoffers D, Booij J*, Winogrodzka A, Wolters EC, Berendse HW
Research Institute Neurosciences Vrije Universiteit, Dept of Neurology, VU University Medical Center, Amsterdam, *Dept of Nuclear Medicine, Academic Medical Center, University of Amsterdam, Amsterdam

Dopamine transporter (DAT) single photon emission computed tomography (SPECT) has been used to assess presynaptic dopaminergic function in patients with various parkinsonian syndromes. In some studies, a relative sparing of the caudate nucleus and/or an asymmetrical pattern of striatal involvement distinguished idiopathic Parkinson's disease (IPD) from atypical parkinsonian syndromes (APS) at group level. It could be hypothesized that these distinguishing features are most pronounced at an early disease stage, and thus potentially useful in predicting a later change of diagnosis in individual cases.
The present study included 72 patients with an initial clinical diagnosis of IPD, supported by decreased ligand binding during [^{123}I]β-CIT SPECT imaging at the time of diagnosis, before anti-parkinson treatment was initiated. During a follow-up of 36 to 80 months, diagnosis was changed to APS in ten patients. Baseline [^{123}I]β-CIT SPECT scans of patients (re)diagnosed with APS were compared to those in whom the diagnosis of IPD was maintained, retrospectively
In the group of patients with APS, ligand binding in both caudate nuclei was lower than in the group of patients with IPD. In addition, putamen to caudate binding ratios were higher in the group of APS patients. The distributions of individual [^{123}I]β-CIT binding values, however, showed considerable overlap between the groups of IPD and APS patients. No group differences were found in putamen binding or asymmetry indices.
In conclusion, early stage [^{123}I]β-CIT SPECT scanning in untreated parkinsonian patients revealed a relative sparing of the caudate nucleus in IPD patients compared to patients later (re)diagnosed with APS. In individual cases, however, the predictive value of the pattern of striatal involvement for a later re-diagnosis of APS would appear to be limited, due to the clear overlap in individual SPECT data.

Diederick Stoffers, Department of Neurology, VU University Medical Center, PO Box 7057, 1007 MB Amsterdam, The Netherlands, t +31.20.444.0708, e-mail d.stoffers@vumc.nl

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