Evaluation of Multiple System Atrophy Subtypes with FDG-PET

Sir,

Seniaray N, *et al*. Recently analysed the functional spectrum of multiple system atrophy (MSA) using ^{18}F-FDG PET/CT and ^{99m}Tc TRODAT-1 SPECT in 67 patients with clinically diagnosed MSA (29 MSA-P, 25 MSA-C and 13 mixed subtypes).[1] While dopamine transporter (DAT) imaging with TRODAT-1 SPECT cannot distinguish between MSA, PD, DLB and PSP and cannot differentiate MSA-P from PD and MSA-C, subtypes show characteristic patterns of FDG uptake on PET scan: MSA-P subjects showed diffuse hypometabolism in putamen-pallidum with relative sparing of the caudate nuclei, while in MSA-C patients hypometabolism was seen in cerebellum and brainstem. In mixed subtypes, variable hypometabolism in basal ganglia, cerebellum and brainstem was associated with that in fronto-parietal regions. Thus, FDG-PET may help in differentiating the subtypes of MSA in the presence of overlapping syndromes.

Targeting postsynaptic dopaminergic function using [^{123}I] FP-CIT SPECT does not differentiate PD from MSA (both showing normal or increased signal),[2] DAT imaging showed more prominent and earlier DAT loss in anterior caudate and ventral putamen in MSA,[3] although normal DAT imaging does not exclude MSA.[4] In autopsy-confirmed cases, a greater asymmetry of striatal binding was seen in MSA than in PD,[5] but it is highly correlated with substantia nigra cell loss.[6] ^{18}F-DOPA-PET showed more widespread basal ganglia dysfunction in MSA than in PD without evidence of early compensatory increase in DOPA uptake.[7] The above FDG-PET data confirm previous studies showing different patterns of decreased glucose metabolism between MSA-P and PD with a positive predictive value of 95%,[8,9] while MSA-related patterns of metabolic topographies discriminated between normal, MSA, PSP and PD, and correlate with standard ratings of clinical stages and motor symptoms in MSA.[10] Moreover, they show further possibilities in differentiating the various subtypes of MSA. In conclusion, ^{18}F-FDG PET provides a new basis for the differentiation of MSA-P and MSA-C,[11] reflecting distinct clinical features of MSA.[12] Future neuroimaging studies, such as Tau-PET will enlarge the diagnostic spectrum of MSA, its functional subtypes and its differentiation from other parkinsonian syndromes.

Acknowledgement

The author thanks Erich Mitter-Ferstl, PhD, for secretarial work.

Kurt Jellinger

Institute of Clinical Neurobiology, Vienna, Austria

Address for correspondence: Dr. Kurt Jellinger,
Institute of Clinical Neurobiology Alberichgasse 5/13,
A-1150 Vienna, Austria.
Phone and Fax: +43-1-5266534
E-mail: kurt.jellinger@univie.ac.at

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Submitted: 20-Jan-2021 **Accepted:** 20-Jan-2021 **Published:** 09-Jul-2021

DOI: 10.4103/aian.AIAN_54_21