

# Non Motor Symptoms in Parkinson's disease and putamen dopamine transporter (DaTscan) uptake: A survey of 85 patients

Mubasher A Qamar, Anna Sauerbier, Alexandra Rizos, K Ray Chaudhuri

National Parkinson Foundation International Centre of Excellence, Department of Neurology, King's College Hospital, London, UK; Department of Basic and Clinical Neuroscience, The Maurice Wohl Clinical Neuroscience Institute, King's College, London, UK

## OBJECTIVE

We addressed association between 30 non-motor symptoms (NMS), using the validated Parkinson's disease (PD) NMS Scale (NMSS), and DaTscan putamen uptake ratios as part of a large-scale multi-centre naturalistic NMS study.

## BACKGROUND

NMS in PD are heterogeneous and have been proposed to have both dopaminergic and non-dopaminergic pathophysiology. Pre-synaptic striatal dopamine transporter (DaTscan) may thus provide a surrogate marker for some dopaminergic NMS.

## METHOD

Data was collected from the UK arm of the NMS International Longitudinal Study (NILS, UKCRN No 10084), 85 PD patients who had undergone a battery of motor and non-motor assessments as well as DaTscan (123I FP-CIT, Ioflupane) imaging were analysed. Association between NMS and DaTscan uptake was calculated using Spearman's rank correlation.

## RESULTS

PD patients (71.8% male, mean age 62.05±12.05 years, mean disease duration 3.28±3.43 years, age of PD onset 58.77 ± 12.27 years) had a mean NMSS total score of 50.35±40.62 and a mean NMS Questionnaire total score of 7.44 ± 6.51. NMS and DaTscan putamen uptake correlation was statistically significant for visual hallucinations, delusions, dribbling of saliva, and olfaction (table 2). NMS burden and DaT uptake had a "very weak" correlation (right putamen r=-0.191, p=0.080; left putamen r=-0.231, p=0.033).

TABLE 1: PATIENT DEMOGRAPHICS

N = 85	Mean	SD
Age (yrs)	62.05	12.10
Age of Onset (yrs)	58.77	12.27
Duration of disease (yrs)	3.28	3.40
SCM total	17.13	9.36
HADS total	12.44	8.03
PDSS total	106.61	27.85
PDQ-8 total	8.60	6.95
NMSS total*	50.35	40.62
NMS Quest total	7.44	6.51
*NMS Burden (cohort mean)	Moderate	
Mean HY Stage	2	

SCM: Scale for Outcomes in Parkinson's disease; HADS: Hospital anxiety and depression scale; PDSS: Parkinson's disease sleep scale; PDQ-8; Parkinson's disease questionnaire; NMS: non motor symptoms; NMSS: NMS scale; NMS Quest: NMS Questionnaire; HY: Hoehn and Yahr

NMS Burden grading (based on NMSS): 0 no burden; 1-20 Mild burden; 21-40 Moderate burden, 41-70 Severe burden, >71 Very severe burden (Chaudhuri et al., 2013)

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TABLE 3: MEAN DaTscan UPTAKE

	Mean	SD
Right striatum	1.21	0.52
Left striatum	1.26	0.48
Right caudate	1.51	0.60
Left caudate	1.52	0.56
Right putamen	0.90	0.46
Left putamen	0.99	0.42

King's dopamine transporter scan uptake grading system: Normal (>2.0); Mild (1.5 to 2.0); Moderate (1.0 to 1.5); Severe (<1.0)

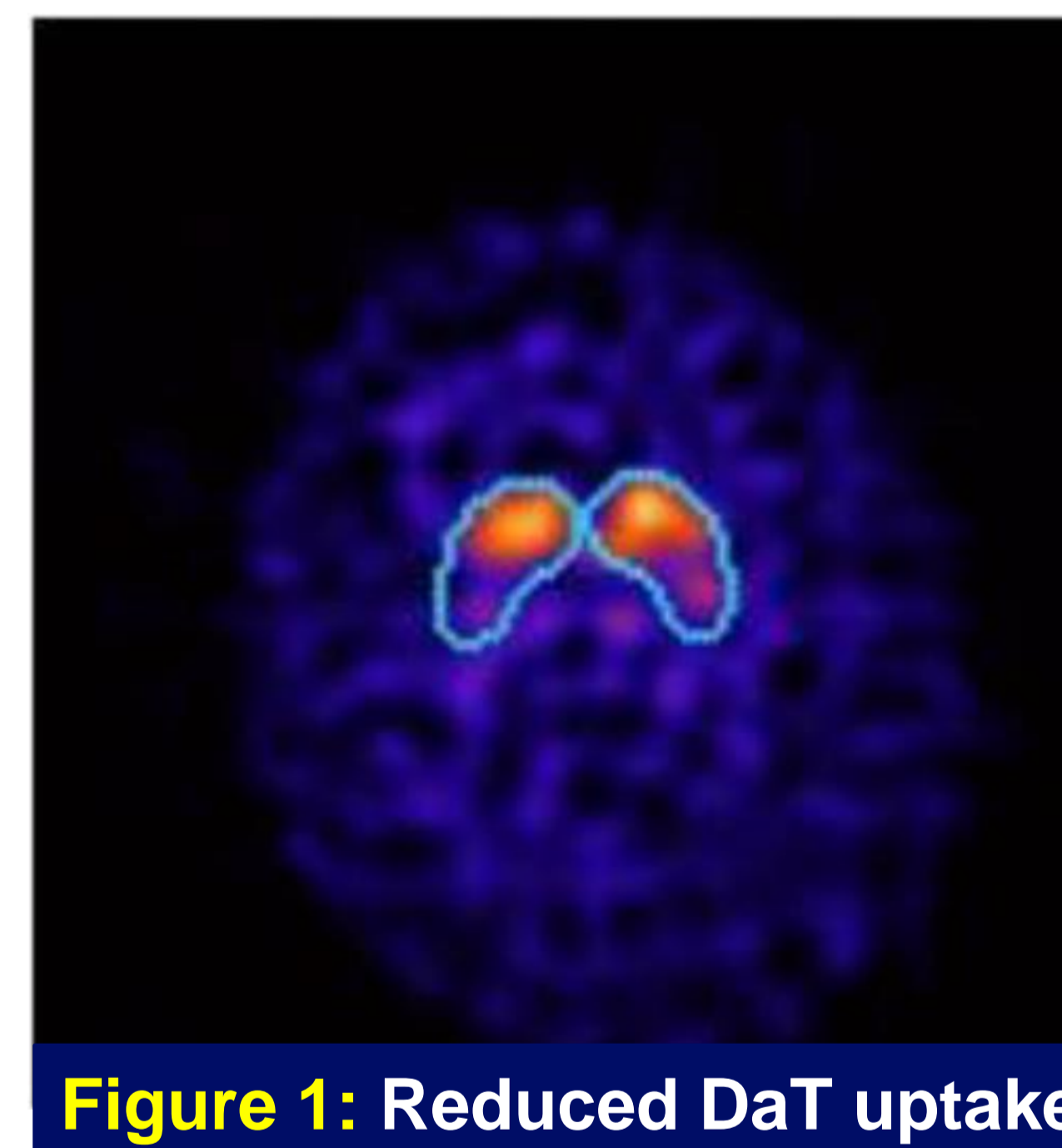


Figure 1: Reduced DaT uptake

## CONCLUSION

- A minority of NMS showed weak correlation with putamen DaT uptake
- However, the correlation was weak and largely insignificant
- **This suggests that the dominant pathophysiology of NMS is mainly non-dopaminergic.**

TABLE 2 : PUTAMEN DATSCAN & NMSS ASSOCIATIONS

		Right Putamen	Left Putamen
NMS1	Orthostatic hypotension	0.147	0.098
NMS2	Blackout	-0.209	-0.202
NMS3	Daytime sleepiness	-0.073	-0.147
NMS4	Fatigue	-0.147	-0.146
NMS5	Difficulty sleeping	0.204	0.044
NMS6	Restless legs	-0.016	-0.148
NMS7	Loss of interest	-0.131	-0.101
NMS8	Lack motivation	-0.201	-0.181
NMS9	Nervous	-0.080	-0.024
NMS10	Depressed	-0.006	0.089
NMS11	Flat moods	-0.051	-0.143
NMS12	Pleasure problems	-0.035	0.029
NMS13	Visual hallucinations	-0.238*	-0.287*
NMS14	Delusions	-0.230*	-0.203
NMS15	Double vision	-0.022	-0.137
NMS16	Concentration problems	-0.108	-0.167
NMS17	Short-term memory problems	-0.011	-0.111
NMS18	Memory problems	-0.042	-0.058
NMS19	Dribbling of saliva	-0.264*	-0.253*
NMS20	Swallowing difficulty	-0.119	-0.161
NMS21	Constipation	-0.138	-0.202
NMS22	Urinary urgency	-0.099	-0.156
NMS23	Urinary frequency	-0.044	-0.036
NMS24	Nocturia	-0.018	-0.056
NMS25	Altered sex interest	0.082	-0.032
NMS26	Problems having sex	-0.056	-0.023
NMS27	Pain	0.023	0.007
NMS28	Olfactory changes	-0.362*	-0.151
NMS29	Weight change	-0.102	-0.049
NMS30	Excessive sweating	-0.127	-0.122
<b>NMSS Total</b>		-0.154	-0.213

NMSS: non motor symptoms scale (\*Yellow denotes significant association of p<0.05)

### REFERENCES:

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