

CORRELATION BETWEEN NON-MOTOR SYMPTOMS AND ¹²³I-FP-CIT SPECT IN SARDINIAN PARKINSON'S DISEASE PATIENTS



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Background

Currently, there is not definitive evidence about possible correlation of data obtained at functional imaging of dopaminergic terminal with nuclear medicine techniques (such as ¹²³I-CIT-SPECT) and non-motor symptoms in patients affected by Parkinson's disease (PD).

Objective

To examine the correlation between dopaminergic deficits assessed by ¹²³I-CIT-SPECT and non-motor symptoms in Sardinian PD patients.

Material and Methods

Consecutive PD outpatients from the Movement Disorders Center of the University of Cagliari and with ¹²³I-CIT-SPECT examination were included in our study. Semi-quantitative estimation was performed with the assessment of specific Regions Of Interest (ROI) and the determination of ratio caudate/occipital cortex and putamen/occipital cortex, both at level of affected side and contralateral (Figure 1). Presence and severity of non-motor symptoms were evaluated with the Non Motor Symptoms Scale (NMSS). Motor symptoms and motor disability were assessed with the Modified Hoehn & Yahr (HY) staging and the Unified Parkinson's Disease Rating Scale part-III (UPDRS III) and the analysis of different subtypes according to Williams classification.

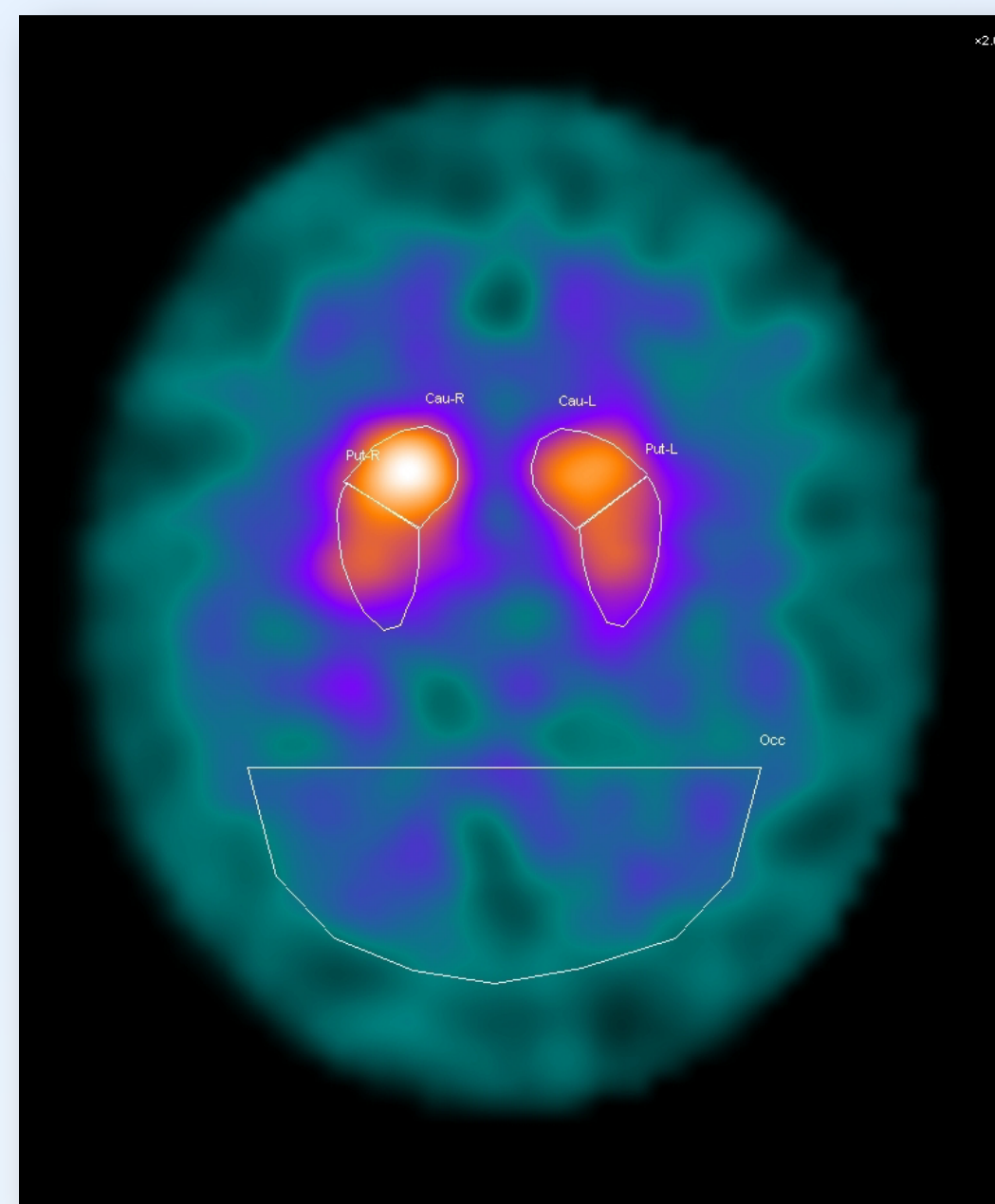


Figure 1: Regions of Interest (ROI) in the ¹²³I-FP-CIT SPECT

Table 1: Clinical features of patients included in the study.

Features examined (52 total patients)	
Male sex, N (%)	27 (51.9)
Age at observation, years (DS)	67.5 (9.2)
Duration of PD, years (DS)	3.9 (2.3)
H&Y stage, average score, (DS)	2.0 (0.6)
UPDRS-III total average score, (DS)	28 (15)
UPDRS-III (subscore Trembling) (DS)	6.25 (3.9)
UPDRS-III (subscore Rigidity) (DS)	5.37 (3.2)
UPDRS-III (subscore Bradykinesia) (DS)	11.1 (7.1)
UPDRS-III (subscore Postural Instability) (DS)	2.5 (2.8)
Trembling form, N (%)	41 (78.8)
Akinetic-rigid form, N (%)	11 (21.2)
Motor fluctuations, N (%)	10 (19.2)
Dyskinesias, N (%)	4 (7.7)

Results and Conclusion

Fifty-two patients (27 male and 25 female) were enrolled. Mean age at enrollment \pm standard deviation was 67.5 ± 9.2 years, with mean PD duration of 3.9 ± 2.3 years (Table 1). Analysis of the single items of NMSS showed a significant negative correlation between striatal uptake and item 28 (disturbances of smell and taste) both for the caudate ($r = -0.302$; $p = 0.030$) and the putamen ($r = -0.290$; $p = 0.029$) (Figure 2-3). No other significant correlations with the other non-motor symptoms were observed. Regarding the correlation between uptake deficiency and motor symptoms, a highly significant negative correlation with the reduced putaminal uptake was highlighted both in relation to the UPDRS score-III [$r = -0.590$ ($p < 0.001$)], and for what concerns the subscores of UPDRS III rigidity [$r = -0.640$ ($p < 0.001$)], bradykinesia [$r = -0.565$ ($p < 0.001$)], and posture/postural instability [$r = -0.399$ ($p < 0.003$)] (Table 2).

We demonstrated a clear correlation between loss of olfaction and taste reported by the patients and dopaminergic deficit relieved at ¹²³I-FP-CIT SPECT, our results also confirmed previous studies evaluating the correlation between dopaminergic impairment at ¹²³I-FP-CIT SPECT and severity of motor symptoms.

Figure 2: Correlation between the item 28 of NMSS (disturbances of smell and taste) and ratio Caudate/Cortex.

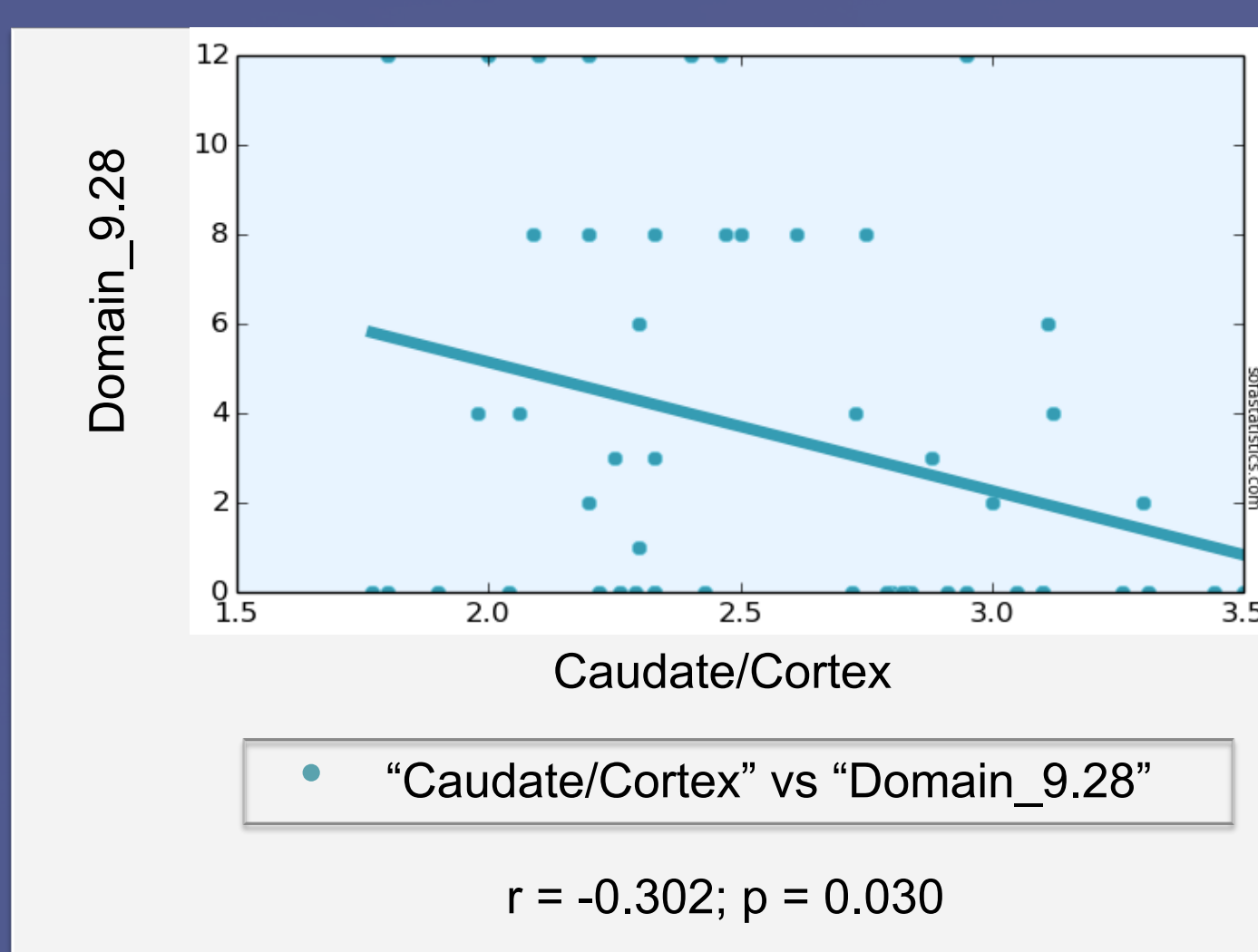


Figure 3: Correlation between the item 28 of NMSS (disturbances of smell and taste) and ratio Putamen/Cortex.

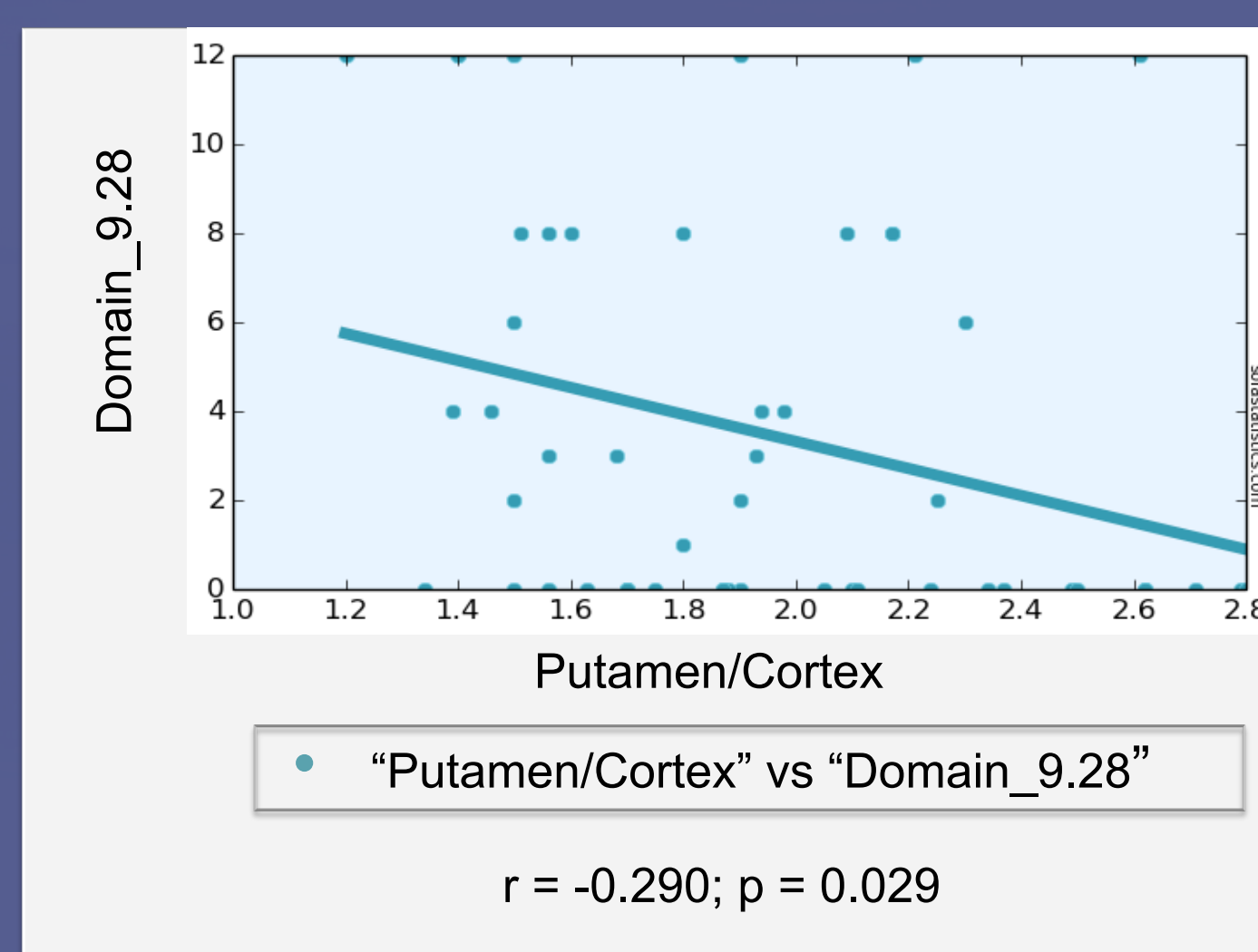


Table 2: Correlations between ratio Striatum/Cortex contralateral and motor clinical features. Subscores obtained according to Williams classification.

	Caudate/Cortex		Putamen/Cortex	
	r	p	r	p
UPDRS III	-0.306*	0.027*	-0.59**	<0.001
H&Y stage	-0.023	0.871	-0.326*	0.018
Subscore UPDRS III Rigidity	-0.384**	0.005	-0.640**	<0.001
Subscore UPDRS III Bradykinesia	-0.240	0.087	-0.565**	<0.001
Subscore UPDRS III Post. Inst.	-0.195	0.167	-0.399**	0.003
Subscore UPDRS III Trembling	-0.139	0.325	-0.190	0.177

References

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