Impulse Control Disorder and Related Behavior Symptoms in De Novo Parkinson Disease Patients

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Objective

To determine the frequency and correlates of impulse control disorder (ICD) and related behavior symptoms in a cohort of de novo, untreated Parkinson disease (PD) patients and healthy controls (HCs).

Method

- Data from the Parkinson's Progression Markers Initiative (PPMI) database (http://www.ppmi-info.org, last accessed on 02/24/2012) was utilized for the purposes of this study
- The PPMI is an observational, international, multi-center study designed to identify PD progression biomarkers[6]
- 311 participants (PD=168, HC=143) with baseline data were analyzed for this study
- At baseline, PD patients are recently diagnosed and untreated

Background

Impulse control disorders are increasingly recognized as a common and clinically significant problem in patients with PD[1]. An important unanswered question is if PD itself confers an altered risk for ICDs and related behaviors, or if the increased risk reported in this population occurs solely in the context of PD medication exposure[2-4].

- **ICDs**
  - include compulsive gambling, buying, eating, and sexual behaviors
  - occur in approximately 15% of PD patients
- **Related Behaviors**
  - Hobbyism- repetition of more complex activities
  - Punding- repetition of non-goal directed activity
  - Walkabout- aimless wandering
- **QUIP**[5]
  - screening instrument for ICDs and related disorders in PD
- **QUIP-S**
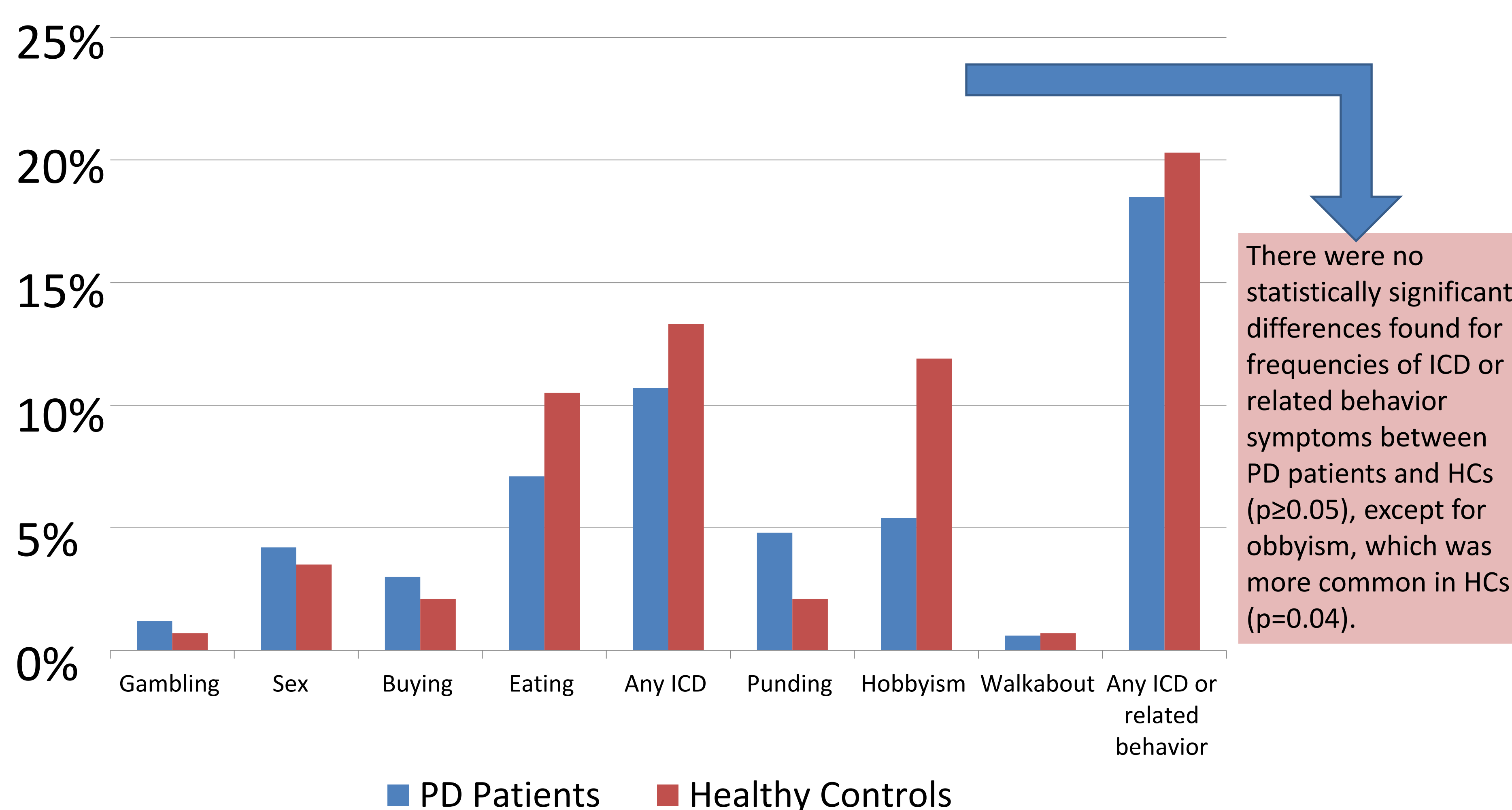 - Abbreviated version of the QUIP (used in this study)

Results

Demographic and clinical characteristics

Variable	PD Patients (N=168)	Healthy Controls (N=143)	Statistic (t test, Mann-Whitney U test, or chi square)
Age (mean, [SD])	61.5 (9.5)	59.1 (12.0)	z= -1.6, p=0.12
Sex (% male)	71.4	56.6	7.4 (1), p=0.007
Race (% white)	96.4	93.0	1.9 (1), p=0.17
Education (# years)	15.8 (2.7)	16.0 (2.8)	z= -0.7, p=0.51
UPDRS motor score (mean, [SD])	21.6 (8.6)	-	-
Hoehn and Yahr stage (median)	2.0	-	-
MoCA (mean, [SD])	27.1 (2.2)	28.3 (1.1)	z= -5.0, p<0.001
Semantic Fluency (mean, [SD])	48.8 (11.0)	52.5 (11.1)	z= -3.1, p=0.002
Letter Number Sequencing (mean, [SD])	10.8 (2.4)	10.9 (2.5)	z= -0.2, p=0.85
GDS-15 (mean, [SD])	2.2 (2.4)	1.4 (2.3)	z= -4.2, p<0.001
DaTSCAN striatal:occipital ratio[a]			
Right caudate	1.4 (0.4)	2.0 (0.4)	12.7 (278), p<0.001
Left caudate	1.4 (0.4)	2.0 (0.4)	z= -10.6, p<0.001
Right putamen	0.7 (0.3)	1.4 (0.4)	z= -12.4, p<0.001
Left putamen	0.7 (0.3)	1.4 (0.4)	z= -12.9, p<0.001

[a] N=280 (PD=163; HC=117)

Logistic regression models examining predictors of ICD or related behavior symptoms in entire study population

	Any ICD[a] (N=37)	Punding or Hobbyism[b] (N=33)	ICD or Related Behavior[c] (N=60)
Diagnosis (PD versus HC)	-0.48 (0.39), p=0.23	-0.70 (0.42), p=0.10	-0.43 (0.33), p=0.19
Age	-0.02 (0.02), p=0.20	-0.02 (0.02), p=0.40	-0.01 (0.01), p=0.37
Sex	0.07 (0.39), p=0.86	0.14 (0.41), p=0.74	0.01 (0.32), p=0.97
MoCA	-0.08 (0.11), p=0.46	-0.17 (0.11), p=0.10	-0.14 (0.09), p=0.11
GDS-15	**0.18 (0.06), p=0.002**	0.09 (0.07), p=0.17	**0.17 (0.06), p=0.002**

[a] Chi-square=12.6 (df=5), p=0.03 for model. B (SE), p value presented for each variable.
[b] Chi-square=6.8 (df=5), p=0.24 for model.
[c] Chi-square=15.2 (df=5), p=0.01 for model.

Frequencies of ICD and related behavior symptoms in PD patients and healthy controls

There were no statistically significant differences found for frequencies of ICD or related behavior symptoms between PD patients and HCs (p≥0.05), except for hobbyism, which was more common in HCs (p=0.04).

Correlates of ICD or related behavior symptoms in PD patients

ICD Type	ICD + (N=18)	ICD - (N=150)	Statistic (t test, Mann-Whitney U test, or chi square)	ICD or Related Behavior + (N=31)	ICD or Related Behavior − (N=137)	Statistic (t test, Mann-Whitney U test, or chi square)
Age (mean, [SD])	58.8 (11.2)	61.9 (9.2)	1.3 (166), p=0.19	59.4 (11.0)	62.0 (9.1)	1.4 (166), p=0.15
Sex (% male)	72.2	71.3	0.006 (1), p=0.94	71.0	71.5	0.004 (1), p=0.95
Race (% white)	94.4	96.7	0.2 (1), p=0.63	96.8	96.4	0.01 (1), p=0.91
Education (# years)	16.1 (2.0)	15.8 (2.7)	z= -0.6, p=0.54	15.7 (2.1)	15.9 (2.8)	z= -0.1, p=0.91
UPDRS motor score (mean, [SD])	21.3 (5.7)	21.7 (8.9)	z= -0.3, p=0.80	19.1 (6.0)	22.2 (9.0)	z= -1.6, p=0.12
Hoehn & Yahr stage (median)	2.0	2.0	p=0.51	2.0	2.0	p=0.81
MoCA (mean, [SD])	27.1 (2.2	27.1 (2.2)	z= -0.3, p=0.75	26.5 (2.4)	27.3 (2.1)	z= -1.6, p=0.11
Semantic Fluency (mean, [SD])	50.1 (11.7)	48.6 (10.9)	z= -0.4, p=0.69	48.3 (10.1)	48.9 (11.2)	z= -0.4, p=0.68
Letter Number Sequencing (mean, [SD])	10.2 (2.9)	10.9 (2.4)	z= -0.7, p=0.47	10.8 (2.7)	10.8 (2.4)	z= -0.3, p=0.81
GDS-15 (mean, [SD])	**3.8 (3.0)**	**2.0 (2.3)**	**z= -2.9, p=0.004**	**3.2 (2.7)**	**2.0 (2.3)**	**z= -2.8, p=0.005**
DaTSCAN striatal :occipital ratio						
Right caudate	1.5 (0.5)	1.4 (0.4)	-1.4 (18), p=0.18	1.5 (0.5)	1.4 (0.4)	-1.1 (37), p=0.26
Left caudate	1.4 (0.5)	1.4 (0.3)	z= -0.005, p>0.99	1.4 (0.4)	1.4 (0.3)	z= -0.1, p=0.90
Right putamen	0.7 (0.3)	0.7 (0.3)	z= -0.7, p=0.48	0.7 (0.3)	0.7 (0.3)	z= -0.7, p=0.47
Left putamen	0.7 (0.2)	0.7 (0.3)	z= -0.6, p=0.54	0.7 (0.3)	0.7 (0.3)	z= -0.5, p=0.63

Conclusions

- **PD itself does not confer an increased risk of experiencing ICD and related behavior symptoms.**
- These results further support the idea that PD medications lead to the development of ICDs and related behaviors in PD.
- Additional findings are that increasing severity of depression is associated with these symptoms in both the entire population and in PD patients, suggesting a non-specific association.
- Given that approximately 20% of newly diagnosed PD patients screen positive for ICD or related symptoms, long-term follow-up is needed to determine if such patients are at increased risk for ICD development once PD medications are initiated.

References

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