The Role of Dopaminergic Medication Doses in Impulse Control Disorders in Parkinson’s Disease

Joohee Jimenez-Shahed, M.D., Krystin Baker, M.D., Anthony Davidson, M.S., and Joseph Jankovic, M.D.

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BACKGROUND

- ICD in PD patients has been linked to DA use but may occur in patients without DA exposure.
- The ICD spectrum includes craving for sweets, gambling, shopping, computer use, binge eating, and sexual activities.1
- The role of dopaminergic medication dosages on the whole spectrum has not been described, although pramipexole is most often incriminated.
- The objective of this study is to describe the relationship between exposure to levodopa and dopamine agonists (DA) and the presence of various ICD in a group of patients with PD.

METHODS

Patients with idiopathic PD and unaffected controls completed self-administered questionnaires regarding various ICD:
- South Oaks Gambling Screen1 (SOGS)
- Yale-Brown Obsessive Compulsive Screen – Shopping Version1 (YBOCS-SV)
- YBOCS – Computer Use Version (YBOCS-CUV; modified from the YBOCS-SV)
- Sexual Compulsivity Scale2 (SCS)
- YBOCS – Binge Eating3 (YBOCS-BE)
- Craving Questionnaire (modified from Alcohol Craving Questionnaire)3

Inclusion criteria
- Idiopathic Parkinson’s disease (PD patients only)
- Able and willing to complete rating scales
- Written informed consent

Exclusion criteria
- Current participation in another clinical study
- History of unstable psychiatric disease (as determined by the investigator)

All subjects completed all questionnaires. Scales were scored according to published guidelines.

Patients were grouped according to active DA use, and the prevalence of ICD in each were compared.

Mean total levodopa equivalent doses and DA equivalent doses were compared.

RESULTS

- ICD amongst PD patients occur more often in those taking DA.
- These differences were not statistically significant, but this could be due to small sample size
- The dopaminergic medication exposure was higher (but not statistically significant) in those with ICD, but there was no difference between individual DA equivalent doses.
- Patients with and without ICD were exposed to similar dosages of dopaminergic medication.
- This suggests the possibility that underlying factors (other than medications) that vary between individuals with PD may contribute to the development of ICD.
- Such factors may include past or family history of psychiatric disorders or substance use/abuse, duration of PD, or age at onset of PD1,2.
- In this small study, the odds ratio for ICD in PD patients taking either pramipexole or ropinirole was similar.
- The odds ratio was lowest with levodopa alone.
- Pramipexole and ropinirole both stimulate D2/D3 receptors, but pramipexole has much greater D3 affinity than either DA.
- Functional neuroimaging studies suggest differential (reduced) activation in the ventromedial prefrontal cortex and the ventral striatum in the brains of patients with ICD who do not have PD.3,4
- D1-like receptors are predominant in frontal areas.
- D1 and D2-like receptors are present in the striatum and nucleus accumbens.
- Dopaminergic deficit in PD may predispose patients to development of ICD after treatment with D2-like and/or D1-like receptor agonists through stimulation (or over-stimulation) of reward pathways including nucleus accumbens.
- This study suggests that exposure to non-ergot DA in general (and in one case, an ergot DA), rather than individual drugs, predispose to ICD.
- Larger studies are needed for confirmation.

CONCLUSIONS

- ICD in PD patients has been linked to DA use but may occur in patients without DA exposure.
- The ICD spectrum includes craving for sweets, gambling, shopping, computer use, binge eating, and sexual activities.1
- The role of dopaminergic medication dosages on the whole spectrum has not been described, although pramipexole is most often incriminated.
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REFERENCES