ORIGINAL ARTICLE

Impulse Control Disorder in Patients with Parkinson's Disease Taking Levodopa

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ABSTRACT
Objectives: To determine the prevalence of impulse control disorder (ICD) in the patients of Parkinson Disease (PD) taking Levodopa.
Methods: This 12 months cross-sectional study was carried out at the Department of Neurology, Services Hospital Lahore and Neuro clinic, Lahore. A total of 125 cases of Parkinson Disease taking Levodopa as treatment with the age of 53 to 71 years were included in the study. They were assessed for four impulse control disorders including craving for sweets, compulsive shopping, compulsive gambling and hypersexuality.
Results: The mean age of the patents in this study was found as 61.34 years. The frequency of ICD was found in 17.6% of the patients with PD. The commonest symptom of ICD was hypersexuality in 11.2% followed by craving for sweets in 10.4%, compulsive shopping in 8.8% and compulsive gambling in 8.1%. ICD was almost comparable to that of associated with dopamine agonists like ropinirole and pramipexole. Furthermore, it was more common in males (80%) than in females (20%).
Conclusions: Parkinson disease patients taking Levodopa must be screened for impulse control disorder for the proper management, adjustment of doses and combination of other drugs.

Keywords: Parkinson's disease, Levodopa, impulse control disorder.

INTRODUCTION
Parkinson's disease (PD) is one of the most common neurological diseases and is ranked on second number in the frequency after Alzheimer disease. PD is a complex disorder, which has a wide variety of symptoms ranging from typical symptoms to non-motor symptoms. Impulse control disorder (ICD), including compulsive gambling, compulsive shopping, hypersexuality and compulsive eating have been reported in Parkinson Disease (PD)[1, 2]. A six month prevalence estimate of ICD in a study was reported to be 13.6% (1.7% to 6.1% for gambling[3], 2.0% to 4.0% for compulsive sexual behavior, 5.7% for compulsive shopping and 4.3% for binge eating disorder)[3-6]. Some studies have suggested an association between dopamine agonist treatment and ICD in PD patients. ICD's in PD patients have also been observed in those taking Levodopa as treatment for PD. It is also seen in some patients who have undergone deep brain stimulation surgery[7-9]. The aim of this study was to recognize the drug related behavioral change in the form of ICD, so that the undue complications of the drugs and the burden of the disease on the patients and the caregivers can be reduced.

PATIENTS AND METHODS
A total of 125 patients, aged from 53 to 71 years, participated in this cross-sectional study. All the patients diagnosed as having idiopathic Parkinson Disease by a consultant neurologist were included. Patients were selected from the Neurology Department of Services Hospital and Neuro Clinic Lahore. Patients on taking Levodopa from last six months, with demonstrated response, on variable doses were included in this study. All the participants were informed about the aims of the study and written informed consent was taken from all the participants. The total span of study was one year from January to December, 2016. Simple questionnaire for the assessment of ICD diagnosis, including craving for sweets, compulsive shopping, compulsive gambling and hypersexuality, anytime in the past six months, was used. All the data were analyzed using SPSS version 20.

RESULTS

The mean age of the patients in this study was found to be 61.34±14.74 years. It was found that most of the patients in the study were male (76%) and were belonging to lower socioeconomic status (66). The mean duration of PD was found as 4.80±2.55 years. All the general characteristics of the patients included in the study are summarized in table 1.

In this study, ICD was found in 17.6% (n=22) of the patients of Parkinson Disease on Levodopa. Among the individual variables of ICD, the commonest symptom of ICD was hypersexuality in 11.2% of patients. All these are outline in figure 1. The presence of two or more ICD's at the same time was found in 7 patients (5.6%). Furthermore, the ICD symptoms were stratified for gender and it was found that these symptoms were not significant in all of these symptoms. Craving for sweets was found in 8 males and 5 females, compulsive shopping in 8 males and 3 females, compulsive gambling in 8 males and 2 females and hypersexuality in 10 males and 4 females. All data is given in table 2.

Table 1: General characteristics of the patients.

Characteristics	
Age (mean ± SD) (years)	61.34±14.74
Gender (n)	
Male	76 (60.8)
Female	49 (39.2)
Socioeconomic status (n)	
Lower	66 (52.8)
Middle	42 (33.6)
High	17 (13.6)
Duration since diagnosis of PD (mean ± SD) (years)	4.80 ± 2.55

Table 2: Frequency of ICD symptoms according to gender.

ICD symptoms		**Male**	**Female**	**p-value**
Craving for sweets	Yes	8	5	0.954
	No	68	44	
Compulsive shopping	Yes	8	3	0.719
	No	68	46	
Compulsive gambling	Yes	8	2	0.194
	No	68	47	
Hypersexuality	Yes	10	4	0.387
	No	66	45	

Figure 1: Frequency of ICD symptoms in PD patients.

DISCUSSION

ICD associated with Levodopa treatment in the patient of PD is an important drug related complication, that after losing attention in the past now again has come to limelight, as an important predictor of outcome, as far as behavior is concerned. In this study, it was found that the incidence of ICD, for all the categories, is 17.6% as a whole. The results of ICD in various studies, associated with Dopamine replacement therapy, are variable due to the reason that there are fewer studies carried out as isolated treatment with Levodopa. Either the studies were done on dopamine agonists or multiple combination of drug treatment. Therefore, it is concluded that before prescribing these drugs, one should warn the patient and the caregivers for the onset of uncontrollable or excessive behavioral addiction of anti-parkinson drugs. After initiation of therapy, physicians should regularly inquire the patients and the caregivers about the conduct that could indicate ICD[10-12]. These drugs should be used less frequently, at the lowest possible therapeutic doses and with great precautions in the patients with obsessive compulsive disorder, bipolar disorders, impulsive behavior, alcoholism, positive family history of ICD or any addictive tendency[13, 14]. The limitation of this study was that the independent associated variables with ICD like dopamine agonist, younger age group, being unmarried, cigarette smoking, family history and pre Parkinson disease behavior of the patients a part of or as a comparison with that of Levodopa was not included. However, in future a well established and more organized, multicenter and larger studies related to this issue can be conducted on the basis of this study. I addition another limitation of this study was that specialized scales like The Massachusetts Gambling Screen

Score for Pathological Gambling and The Minnesota Impulse Disorder Interview Score for compulsive sexual behavior and buying, etc. were not used as they do not fulfill the requirement and found irrelevant to our setup. Therefore, it is recommended that all the patients of PD either on Levodopa or multiple drug therapy must be screened for ICD and must be treated and drugs must be adjusted to reduce the morbidity and the burden on the caregivers to improve the functional outcome.

CONCLUSION

The incidence of ICD increases significantly with the treatment of Levodopa in PD. As ICD is also observed in other diseases like Restless Leg Syndrome and Fibromyalgia treated with Levod0pa and Dopamine Agonists and they have other clinical and demographic correlates that may represent risk factors, therefore, it is recommended that further large scale studies should be carried out to examine and determine the possible relationships between all these factors.

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