

Delusion in Parkinson's disease: A Symptom or an Adverse Effect of Dopamine Agonist - A Case Report

Tutul Chowdhury ^{1*}, Padmaja Deb Roy ¹, Hasanul Islam Chowdhury ²

¹ One Brooklyn Health System, New York, United States of America

² Georgia Cancer Center, Georgia, United States of America

* For correspondence: chowdhurytutul756@yahoo.com

ABSTRACT

Parkinson's disease (PD) which currently has no cure but there are many treatment options to manage symptoms. PD is the second most common neurodegenerative condition affecting not only older people of developed countries but also in people of developed countries in their 50's and 60's. Though it greatly affects motor system, psychotic symptoms such as delusion, hallucination mostly develop at a later stage of disease after several years but early development at the very beginning of the course has also been reported. Delusion can also develop as an inevitable outcome of dopaminergic drugs like carbidopa-levodopa, a common drug-class prescribed at the very beginning of the diagnosis increasing the availability of dopamine in the brain. It's the clinical experience that propounded this link between psychosis and medication use. Psychosis can impact patient's daily life in a severe manner making it more frightening and could be life threatening at times. Therefore, differentiation between the delusion as a symptom and delusion as an effect of medication onset is a crucial part of PD management.

Keywords: Parkinson's disease, delusion, dopamine agonist, rigidity, bradykinesia, psychosis

1. INTRODUCTION

Parkinson's disease (PD) is a neurodegenerative disease caused by over-activity of cholinergic neurons and under-activity of dopaminergic neurons in the substantia nigra. Parkinson's tremor usually ranges from a frequency of 5-7 Hz and is often the initial manifestation. Other initial symptoms that develop in a patient are bradykinesia, muscle rigidity, and shuffling gait.

Some initial signs reported by patients are small handwriting, loss of smell, trouble sleeping, soft or low voice, constipation, masked face, dizziness or fainting, stopping or hunching over. In addition, several non-motor symptoms like neuropsychiatric symptoms, autonomic and sensory disturbances, and sleep disorders may coexist. In later part of the disease, patients develop psychotic symptoms like delusion which can infringe on a person's quality of life.

The time period from initial symptoms to development psychotic symptoms is a subject to debate but mostly it takes years. It is important to identify delusions as soon as possible and take steps to reduce them for well-being of the patient with PD. Not all patients suffer from psychotic symptoms in PD. Between 10-40% of people with PD report experience of delusions. We are reporting a case of PD who had delusion in the very primitive part or diagnosis initially contemplated as an outcome of medication. Eventually dose reduction could not attenuate these symptoms making delusion obviously a disease manifestation and raising the question to differentiate this fact earlier so it can be managed promptly to ensure patients comfort.

2. DESCRIPTION

A 66-year-old right handed male patient, with no history of trauma, presented with pain in the right upper limb in 2008. Initially, he was diagnosed with myalgia and was treated with NSAIDs. After a few months his right lower limb also developed mild pain. Patient was evaluated several times since his initial encounter with the primary care physician and treated with NSAID. Pain was never resolved fully. After about 8 months the patient started to have a resting tremor in right hand which was initially mild but gradually increased. Tremor was associated with rigidity of the right upper and lower limb muscles. The patient began to develop stiffness and difficulty to start the movement especially in the early morning. Carbidopa-Levodopa was prescribed by his neurologist. Rigidity was improving and the patient became less symptomatic over time but the resting tremor never resolved [1].

Unified Parkinson's Disease Rating Scale (UPDRS), a common rating scale consisting of subscale 1 covering mentation, behaviour, and mood, subscale 2 rates of activity of daily living, subscale 3 clinician rating of motor manifestation of PD, subscale 4 complication of therapy, was used during evaluation of the patient [2].

In subscale 1 evaluation, the patient showed no intellectual impairment, vivid dreaming, sustained depression without vegetative symptoms, no loss of initiative in elective activities. In subscale 2, patient's speech was moderately affected, no salivation, no choking, moderately slow and small handwriting, slow and clumsy in food-cutting, utensil handling, slow dressing and hygiene but no help needed, slow in bed-turning and adjusting bedclothes as well, rare falling, frequently freezing when walking, mild difficulties in walking, moderate tremor in right arm, infrequent tremor in left arm, no sensory complaints. On subscale 3, patient showed resting tremor of mild amplitude, absent action tremor, mild to moderate rigidity, mild bradykinesia, monotonal speech quality, abnormal reduction of facial expression, more than one attempt to arise from a chair, slightly stooped posture, shuffling with short steps while walking, able to stop self from falling, moderate degree of slowness in movement. Subscale 4 was not evaluated as dopaminergic drugs were not started yet. MRI done in 2010 reported age appropriate cortical sulcal pattern, non-dilated ventricles. Basal cisterns were patent. No acute haemorrhage or abnormal extra-axial collection. There was no evidence of focal

parenchymal mass or mass effect. Significant nasal septum deviation was noted. It is worth noting that an attempt of follow up MRI after 10 years in 2020 was failed due to his unsteady movement and continuous resting tremor.

During a session pts wife described that pt had always been telling her about someone who is using his computer when he sleeps at night. Pt also had a thought that the person is stealing private pictures. Neurologists considered this delusion as a side effect of Carbidopa-Levodopa. Decreasing the dose was not possible as he was already on the lowest dose. Carbidopa-Levodopa was stopped and Entecapone was started. But after several weeks of follow up pts showed no progress of his psychotic symptoms. His rigidity was increasing in intensity which was alleviating before. Neurologist was convinced with that his delusion was not due to anti parkinsonism drug side effect. It developed as an early symptom of the disease itself. So Carbidopa-levodopa was restarted. Later, due to increasing rigidity and tremor his doses were increased accordingly. In

between 2013-2015 pt was diagnosed with other comorbidities like Coronary artery disease. Now pt also has micrographia. During the time of pts interview he confirmed that he still has the delusion regarding pictures in his computer. For the last 2 years pt developed addiction of using computer and writing articles on several social issues. He can't help using computer and uses for more than 16 hours. Beside this addiction he has developed excessive salivation for which an anticholinergic drug named Trihexyphenidyl was started without any help. Now for the excessive salivation botox injection to the salivary gland is being considered by his neurologist. Pt is still in same delusion and antipsychotic has yet not been considered though his delusion is affecting his sleep pattern in the way of peeping him awake until midnight.

Motor symptoms like rigidity, tremor, bradykinesia are utmost in Parkinson's Disease (PD). Psychosis is also considered a crucial manifestation occurring in less than 10% of



untreated PD patients [3]. Delusion is a core symptom of psychosis comprised of erroneous belief without solid evidence which never follows the process of building belief by experiencing an incidence. Although It is also true that a psychotic patient is not always expected to make hasty decisions. Delusion can be of many type e.g grandiose, somatic, negative affect delusion, delusion of influence and paranoid delusion which is the most common type among all increasing in prevalence eventually [1]. A delusional person is preoccupied with fixed belief in the absence of enough evidence affecting their decision making capacity in comparison of a healthy individual or non-psychotic patient. It should be treated without any delay to lessen the burden of the pt and the caregiver as well. Previously there are case reporting nihilistic delusions or self-negation (Cotard syndrome) and delusion that a friend or family member has been replaced (Capgras syndrome). Furthermore, Othello syndrome (delusional jealousy) was perceived in 2% PD patient along with the remarkable association with dopamine agonist later successfully managed with dose reduction [3]. In terms of risk factors of developing delusion there are studies considering disease duration and severity, as well as therapy with dopamine agonists as predictors of psychosis risk [2-3]. Psychotic symptoms as delusion, common side effects of the dopaminergic drugs, a concern in prescribing these drugs in a patient who has already developed psychotic symptoms [4-5]. Yet, no set of labs are available to evaluate delusion so that ruling out organic cause by imaging and laboratory tests should be an

option. Urine drug screen can be used as a tool for excluding substance abuse.

The patient we are reporting today surprisingly developed delusion, paranoid type earlier. In this case though initially delusion was suspected as an adverse effect of therapeutic accumulation of dopamine in brain but later was considered as a developing symptom of the disease process itself. Patient is under neurology and psychiatric evaluation to initiate antipsychotic as the delusion is affecting his sleep patterns. Being always a topic of discussion, it's hard to differentiate between delusion as a side effect of dopaminergic drugs and a symptom of PD itself which makes it a subject of extensive study. Yet, this discussion has received considerable scientific attention [6-8].

3. CONCLUSION

Delusion very frequently occurring psychotic symptoms can develop in PD both as a symptom and as a side effect of dopaminergic drugs. At times, decreasing the dose is an option to alleviate delusion when it occurs after initiation of drug. If delusion persists, we can consider it a condition as a part of the disease rather than the effect of carbidopa/levodopa. Antipsychotic drugs especially second generation drugs are commonly used to treat Parkinson's delusion. In the setting PD with delusion, high index of suspicion and close monitoring of drug dose modification is needed to differentiate cause of delusion [9]. Addiction to certain behaviour, activities as it was found in this patient should be further studied in more exponential settings.

4. CONSENT

The patient agreed the doctors could use and publish his disease as an article without sharing his personal information.

5. ACKNOWLEDGEMENT

NA

6. CONFLICT OF INTEREST

The authors have declared that there is no conflict of interest.

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