

Parkinson's Disease Patients with Dopamine-Related Personality Features

Pragati Singh*

Department of Biotechnology, Graphic Era University, India

Corresponding Author*

Pragati Singh,

Editor office

Department of Biotechnology, Graphic Era University,

India,

E-mail:singhpragati330@gmail.com

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Abstract

Patients with Parkinson's Disease (PD) can develop behavioural addictions such as excessive gambling or get hooked on their own medicine in rare cases. This is remarkable because PD patients have a low rate of drug usage and a personality type that is opposed to the addicted personality. The relationship between dopamine, personality, and addiction is demonstrated by these unusual addictive diseases, which appear to be caused by excessive dopaminergic pharmaceutical usage. In rare situations, patients with Parkinson's Disease (PD) develop behavioural addictions such as excessive gambling or become addicted to their treatment. This is interesting since Parkinson's patients have a low drug usage rate and a personality type that is opposed to the addicted personality. These uncommon addictive disorders, which appear to be caused by excessive dopaminergic medication use, show the link between dopamine, personality, and addiction.

Keywords: Parkinson's disease • Reward • Novelty seeking • Dopamine • Pramipexole • Ropinirole

Introduction

Although Parkinson's Disease (PD) includes cognitive, behavioural, and emotional symptoms, which are today recognised as a primary source of impairment, it was first defined as a movement disorder with "the senses and the intellect remaining unharmed" in James Parkinson's article on the shaking palsy. The dopamine precursor levodopa and dopamine agonists such as pramipexole and ropinirole are effective in treating movement disorders caused by dopamine deficit in the motor subdivision of the striatum. However, a cluster of addictive illnesses has lately been identified in certain patients: medicine addiction, compulsive behaviours, and behavioural addictions such as pathological gambling, excessive shopping, or hypersexuality. The degradation of dopaminergic circuits projecting to the striatum is a hallmark of Parkinson's disease. These circuits have been linked to the prediction of rewards. In this work, we looked at reward and punishment processing in Parkinson's disease patients who had never been on medication, patients who had recently been medicated with the dopamine receptor agonists pramipexole and ropinirole, and healthy controls. After 12 weeks of therapy with dopamine agonists, the individuals who had never been treated were re-evaluated. A feedback-based probabilistic classification task was used to measure reward and punishment processing. The temperament and character assessment was used to assess personality traits [1]. There's a lot of research on the subject. The idea that certain personality traits are associated with Parkinson's Disease (PD) both before and after the development of the motor disorder illness.' These trials were uncontrolled until recently, but they all seemed to show the same thing that PD is accompanied by a collection of personality disorders .

"Compulsive," "industrious," "rigidly moral," "stoic," "serious," and "silent" are some of the attributes that cluster around these adjectives. Dopamine agonists also strengthened the link between reward processing and novelty seeking, while decreasing the link between punishment processing and harm avoidance. Our findings that dopamine agonist therapy increased novelty-seeking, improved reward processing, and decreased punishment processing in young Parkinson's disease patients may shed light on the cognitive and personality bases of the impulse control disorders that can occur as a side effect of dopamine agonist therapy in some Parkinson's disease patients. There have been several recent examples of this. Three randomised controlled trials in which participants are compared to Patients with PD who are also suffering from other ailments. Patients with Parkinson's disease were shown to be less flexible. Non-motor symptoms are critical to better understanding the stages of Parkinson's Disease (PD) for neurologists involved in clinical care [2].

When compared to the conventional motor indications of PD, these are generally termed "invisible". The progression of Parkinson's disease is divided into three stages: (1) preclinical, which is asymptomatic but can be detected through molecular or imaging markers; (2) premotor, which is characterised by the emergence of non-motor symptoms (e.g., loss of sense of smell, sleep disorders, or orthostatic hypotension) but is insufficient to diagnose the disease; and (3) motor, which presents the classic motor symptoms that allow the clinical diagnosis of PD (such as slowness of movement, tremor, and stiffness).

These syndromes are adverse effects of drugs used to treat Parkinson's disease, and they're now understood to be the result of too much dopaminergic activation [3].

Addiction may be considered a problem with decision-making, learning, and motivation, and dopamine acting on cortico-striatal neurons is implicated in all of these processes. The function of dopamine in reward learning and reinforcement, in particular, provides a mechanism through which repeated use of addictive medications can become compulsive and habitual. Most addictive substances cause dopamine to be released in the brain, and dopamine system injuries reduce the drug's reinforcing effects.

Parkinsonian Personality Before Parkinson's Disease

Patients with Parkinson's disease are less likely to participate in impulsive or addictive conduct. The concept of a parkinsonian personality was first introduced in 1913, and it was widely discussed in psychoanalytic literature during the 1940s and 1950s. Controlled investigations were then conducted to establish the occurrence of the phenomenon. Strict, introverted, and slow-tempered disposition, whose presence may occur before the formation. Another interesting finding was that people with Parkinson's Disease (PD) have a higher rate of death than the general population. A phenomenon in which people don't smoke or drink alcohol. It's regarded to be a characteristic of the personality type just defined [4].

A vast body of evidence suggests that personality has an "indirect" influence on the development of neurodegenerative illnesses. Indeed, some personality qualities have been connected to behaviours and attitudes, which may be linked to health risks. Sedentary behaviour, cigarette smoking, and other behavioural, cardiovascular, and metabolic risk factors for chronic illnesses describe those with high neuroticism/extraversion and low conscientiousness. These characteristics are usually stable throughout maturity, although rapid alterations might be the cause of a range of mental and physical illnesses.

Other investigations found comparable personality differences in the general population. The researcher presented a three-dimensional personality model, with novelty seeking as one of the three dimensions. The tendency to be stimulated and respond favourably to appetitive or novel stimuli is referred to as novelty seeking. Individuals who seek novelty often are impetuous, changeable, excitable, quick-tempered, and extravagant, whereas their opposites are strict, stoic, and patient.

These latter characteristics are similar to those of people with Parkinson's disease, and formal testing has shown that PD patients score lower on Cloninger's measure of novelty-seeking than matched controls. Several studies have connected high novelty-seeking temperament to substance addiction and Impulse Control Disorders (ICDs) such as compulsive gambling in the general population.

Low levels of agreeableness, for example, have also been linked to obesity in older adults, whereas a high level of conscientiousness has been linked to a lower risk of a variety of heart illnesses and strokes. Neuroticism, on the other hand, appears to be the most significant risk factor for a wide range of illnesses. Individuals who are more furious, worried, sad, aggressive, and apprehensive are more likely to develop health-risk behaviours or dementia, according to current research. Some studies have found that in the presence of PD, people are less likely to smoke, drink alcohol, or use caffeine, which is likely due to the restricted and inflexible PP traits of introversion and depression.

However, it is still unknown how the interaction of personality traits and health practices affects the chance of developing PD. Low sensation-seeking scores (which correlate with novelty-seeking) accounted for the majority of the disease OR "Parkinson's disease" AND ("Personality traits" OR "temperament") in a recent case-control study. Duplicate entries across databases were deleted after the initial online search. Additional papers were incorporated through manual search, starting from the reference lists of previously obtained publications, to maximise the possibility that all possibly relevant research was located. Cross-sectional, retrospective or prospective studies were considered for inclusion if they met the following criteria: (a) they included subjects of all ages, but only with a specific interest in PD; (b) they used standardised and well-recognized personality models (FFM, CPM, Eysenck, or Cattell) or psychiatric nomenclature (i.e., MMPI-2); and (c) they were specifically interested in evaluating the relationship.

Parkinson's Disease Addictive Syndromes

Case reports of apparent levodopa addiction began to appear in the literature in the 1980s, prompting the development of official diagnostic criteria. These patients' clinical parameters fulfilled standard ad-

-diction criteria: Intoxication similar to that seen with stimulant drugs like cocaine, with hypomania and impulsivity; continued use despite social and personal difficulties caused by the drug; withdrawal symptoms such as dysphoria and anxiety following dosage reductions; hoarding the drug or obtaining prescriptions from multiple physicians. Pathological gambling, hypersexuality, excessive buying, and compulsive eating are the most frequent of these disorders. We refer to these diseases as disorders of impulse control in this review, as per the Diagnostic and Statistical Manual of Mental Disorders-IV classification. However, there is a trend toward classifying them as "behavioural addictions", since they have a conceptual connection to drug addiction in that people engage in obsessive behaviour despite negative consequences. Many clinical characteristics, risk factors, comorbidities, and neurobiology of ICDs such as compulsive gambling are similar to those of substance addiction. Male sex, young age at the time of PD diagnosis, a premorbid history of drug or alcohol misuse, depression, and increased scores on the personality trait of novelty seeking are all risk factors for the development of both medicine addiction and ICD in people with Parkinson's disease. These are also risk factors for drug addiction in the general population, implying that PD patients who acquire addictions have a premorbid predisposition [5].

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