

A secret gift of creativity – the bright side of life with Parkinson’s disease

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Mozart played the harpsichord at four years and composed music at five with marvelous musical dexterity and creativity. Michelangelo sculpted his famous “La Pieta” when he was only 25 years old. These examples of art gifted persons born as prodigies sound logical.

However, is it possible that a person with no previous artistic skills develops creativity at an older age? Especially after experiencing Parkinson’s disease?

The surprising answer to this question is “YES”. In a review of the neurological literature, we showed a large number of clinical reports on art-naïve persons with Parkinson’s disease who developed artistic skills after the diagnosis of the disease. The genre of art is not limited to painting, on the contrary, it spreads over a colorful spectrum, such as sculpting, wood crafting, poetry, novel writing, playwright, jewelry and lace (Inzelberg, 2013). One article tells the story of a person with Parkinson’s disease (Schrag et al. 2001) who never wrote before. After the diagnosis and treatment initiation, he composed poems and won in an annual contest of the International Association of Poets. Another person (Bindler et al. 2011), with no previous writing talent, developed writing skills leading to a literary prize. Many clinical vignettes are published from diverse countries, pointing to the universality of the phenomenon.

And, if an artist develops Parkinson’s disease, how will art change for her/him?

The British abstract painter John McLean, reported that he experiences greater creativity since the diagnosis of Parkinson’s disease and suggested that levodopa could be “fueling” his recently enriched artistic skills (Shepherd, 2018, Inzelberg, 2018). Dr. Johanne Vermette, an artist and physician with Parkinson’s disease, felt her paintings were enhanced since her illness was diagnosed two years ago. “The new style is less precise but more vibrant, I have a need to express myself more.” She felt more creative since the disease onset, she considered that medication may play a role in enhancing imagination (Pinker, 2002). Artists who practiced before being diagnosed with Parkinson’s, often report an increase of art production, both more florid and more interesting.

Review on the topic reveals the correlation between the awakening of artistic creativity and antiparkinsonian medications (Inzelberg, 2013). In a research study, we have shown (Faust-Socher et al, 2014) that persons with Parkinson's disease have more original ideas, and better understand complex literary metaphors in creativity testing, as compared to age-matched persons without the disease.

A multitude of questions surround these observations. In fact, Parkinson's disease causes motor impairment including tremor, muscle rigidity, slowing of motion and difficulty in coordination. One question would then be "how such motor dysfunction enables artistic work?" posing a paradox for augmented creative behavior, since it is prototypically characterized by diminished of motor and executive abilities. Surprisingly, persons report being "in complete control" or "I don't feel any limitation while painting, just to urge to paint more" or "while performing art, the movement just flows" ..(personal communications). There is an increase in the desire to create art. In some persons this desire may be excessive. "I cannot stop painting at night, I must go on and on". This behaviour diminishes after reduction in the dose of medications.

What are the scientific explanations for the phenomenon of enhanced creativity in art-naïve persons or the change in artists?

Clinical observations provide evidence focusing on dopamine and the neuroarchitecture of the brain. One main neurotransmitter which is lowered in the brain of persons with Parkinson's disease is dopamine. Levodopa is given as medication aiming to increase dopamine levels in the brain. The use of levodopa and/or of another pharmacological group of medication, namely dopamine agonists seems to stimulate creativity. It is yet unclear whether it is the Parkinson's disease related neuropathology or its combination with dopaminergic treatment that prepare the ground for this outburst of creativity.

Three primary pathways regulate the brain's dopamine expression. (1) One main and well-known pathway affected in Parkinson's disease is the motor one. Motor control is regulated by the nigrostriatal pathway (specifically affecting the substantia nigra and an area named the dorsal striatum in the brain). Disruption in this pathway, causes motor symptoms, such as tremor, rigidity and slowing of motion. Treatment with levodopa or dopamine agonists restores dopamine levels and ameliorates motor functions.

The two other pathways of dopamine are the (2) mesocortical pathway, which connects with the parts of frontal lobe of the brain and (3) the mesolimbic one, often referred as the reward pathway. The mesolimbic pathway is enrolled, beyond reward, in idea generation, motivation, impulsivity and flexibility. Levodopa and dopamine agonists may stimulate the activity in these pathways and prepare the basis for increased motivation and idea generation. The person feels the ability for originality, reward from art making and impulsivity. Latent inhibition is the capacity of the brain to filter irrelevant stimuli. It may diminish in Parkinson's disease treated with dopaminergic medications, and as such, the lack of latent inhibition may facilitate original recombinant ideation. High dopamine levels may disrupt latent inhibition via alterations in the mesolimbic and mesocortical dopaminergic pathways (Chakravarty, 2010, Boot et al, 2017). Divergent thinking, novelty

seeking behaviour, some degree of suppression of latent inhibition and change in the function of the frontal parts of the brain may all be required like a fine and exquisite recipe.

We must understand however, that these explanations are far from being complete and that the topic is still debated. A sudden appearance of artistic skills may also appear in other brain conditions where dopamine related medications are not used. Other pathways and other neurotransmitters such as noradrenaline and serotonin may also be involved.

Regardless of our understanding of the underlying mechanisms, the “gift” brings a bright side to life with Parkinson’s disease. Remarkably, the sole use of dopamine related medications in persons without Parkinson’s disease does not generate an artistic urge. It seems that the awakening of artistic creativity is an exquisite and specific secret gift given to persons with Parkinson’s disease.

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