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Neurobehavioral assessment of Vanillin in MPTP-induced mouse model of Parkinson's disease

Parkinson's disease (PD) is the second most common neurological disorder. It is clinically marked by motor dysfunction due to a severe loss of SNpc neurons and dysfunction in nigrostriatal dopamine systems. The drugs currently available for the treatment of PD either have adverse effects or have suboptimal efficacy. On the other hand, flavonoids are strong antioxidants with minimal damage with long-term usage, suggesting that they might be useful as a long-term treatment for PD. Vanillin (Van), a phenolic compound, is one such flavonoid that has been found to have antioxidant and neuroprotective characteristics in a variety of neurological disorders. Because there has been limited research on the neuroprotective role of Van in PD, the current study looked into its potential neuroprotective impact against MPTP-induced neurobehavioral deficits in a mouse model of PD. To determine the potential neuroprotective effects of Van on motor balance and coordination in the MPTP-induced PD model, we performed the pole test, narrow beam test, and forced swim test at the end of the experiment. Five groups of animals were studied for behavioural changes after the induction of PD and treatment with Van for 21 days. In the current study, Van successfully alleviated the deficits of MPTP-induced motor function. The results showed a significant difference in the pole test, narrow beam test, and forced swim test compared to the control mice given normal saline. MPTP-intoxicated mice showed motor dysfunctions, including taking longer time to descend in the pole test and taking longer time to cross the beam with more foot slips and more immobility time as compared to the control group. There was a significant reduction in motor impairment in the pole test, which showed decreased time spent crossing and foot slip numbers and also reduced immobility time in the Van, MPTP+Van, and L-DOPA treated groups when compared with the MPTP-intoxicated group. These results indicate that Van attenuated MPTP-induced motor dysfunction.

Biography

Linchi Rani completed her MSc in Biochemistry from the PGIMER, Chandigarh, India. Currently, she is pursuing her PhD from the Laboratory of Cellular and Molecular Neurobiology (Lab 215), School of Life Sciences (SLS), Jawaharlal Nehru University (JNU) under the supervision of Dr. Amal Chandra Mondal, Associate Professor, SLS, JNU. She is interested in studying the use of phytochemicals exhibiting significant free radical scavenging activities and minimal toxicity even after prolonged usage, indicating that they might be potential innovative therapeutic strategies for Parkinson's Disease. She has published two review articles in reputed international journals. She has also given one poster and one oral presentation at national and international conferences.

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