

Apocynin administration ameliorates motor deficits in Paraquat-induced Parkinsonism

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Background: Parkinson's Disease (PD) is the second most common progressive neurological disorder after Alzheimer's, characterized by presence of intra- cytoplasmic inclusion bodies known as Lewy body containing α - synuclein aggregate and the loss of dopaminergic neurons in the substantia nigra regions of the brain. The exact cause of dopaminergic neuronal loss in PD remains unknown for a long time, however, recent studies report that oxidative stress plays a key role in the pathogenesis of PD. Paraquat (PQ), a widely used herbicide is an oxidative stress inducer that has been implicated as a potential risk factor for the development of PD. Pharmacological approaches targeting antioxidant machinery may have therapeutic value against PD. Flavonoids are naturally occurring polyphenolic compounds that display a variety of therapeutic properties against oxidative stress. Apocynin (4-hydroxy-3- methoxyacetophenone) is a natural flavonoid obtained from medicinal plant *Picrorhiza kurroa* that exhibits neuroprotection against PD-related pathology. However, studies on its neuroprotective role and the underlying mechanisms are scarce.

Aim: The proposed study will explore the potential beneficial effect of Apocynin on PQ-induced motor deficits in rat model of Parkinsonism.

Methods: As a part of preliminary study, we have developed PQ-induced Parkinsonism model in adult Wistar rats. We performed motor coordination related behavioral experiments and histopathological studies in order to validate the establishment of PQ-induced Parkinsonism. Then we determined the effect of apocynin on PQ-induced motor deficits in rat model of Parkinsonism.

Results: PQ-induced nigro-striatal dopaminergic neurodegenerations in the rat model of Parkinsonism. Apocynin improved motor deficits in PQ-induced rat model of Parkinsonism.

Conclusion: Apocynin treatment ameliorates PQ-induced motor deficits in the rat model of Parkinsonism. In future, we will be assessing the neuroprotective effect of Apocynin in the developed model of Parkinsonism.

Keywords: Parkinson's disease, Paraquat, Neuroprotection, Apocynin, Neurodegeneration.

Biography

Myself Sandeep, pursuing my Ph.D. in neurobiology at Jawaharlal Nehru University. I am having passion for research in neurodegenerative disease. Currently I am working on Parkinson's disease. The *in-vivo* model that I am working is paraquat-induced Parkinsonism. Parkinson's disease is a progressive neurological disorder affecting more than 1% of population over age of 60 years. It has motor as well as non-motor symptoms. Aggregation of α -synuclein in the form of Lewy body and loss of dopaminergic neurons in the striatum and substantia nigra region of the brain is pathological hallmark of the disease. Current treatment strategies available are use of L-DOPA or its agonist. But long-term treatment with these results in the bradykinesia, motor fluctuations. So presently no complete cure is available against the disease. I am targeting the molecular pathway involved in the onset and progression of the disease that may open.

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