

Parkinson's Disease

## **NEUROPROTECTIVE POTENTIAL OF LIMONENE IN LPS INDUCED PARKINSON'S DISEASE IN RATS**

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Background: - Parkinson's disease is 2nd most disabling neurodegenerative disorder characterized by progressive loss of dopaminergic neurons in basal ganglia. There are different pathologies that count for PD like neuro-inflammation. This study highlights the role of oxidative stress and inflammation in progression of PD where limonene shows antioxidant and anti-inflammatory response. Method: - Wistar rats (200-250gm) of either sex were taken and divided into 6 groups. Animals were treated with three different doses of limonene i.e. (25, 50, 100 mg/kg p.o.) for 21 day, starting 1 day prior to LPS 5µl(1mg/ml PBS) infused stereotaxically into the SN of rats. Results: - The catalepsy technique was used to analyze the clinical signs of Parkinson's disease in rats. LPS significantly increased oxidative stress indicators in the animals and decreased systemic antioxidant synthesis. Biochemically limonene significantly reduced the oxidative-nitrosative stress, as evidenced by decrease in malondialdehyde and nitrite levels, and restored the reduced catalase, glutathione and Superoxide dismutase levels. The observed beneficial effects of limonene in motor defects may be due to its ability reduce oxidative burden. Conclusion: - LPS is potent inflammatory biomarker but this also has major role in development of oxidative stress. Interaction between reactive oxygen species and dopamine leads to its depletion & considered as one of the major mechanism for dopaminergic degeneration in PD. LPS caused significant elevation in malondialdehyde, nitrite and decline in SOD, catalase & glutathione, indicating development of oxidativenitrosative stress. Limonene treatment significantly reduced striatal MDA and nitrite concentration & restored antioxidant enzyme activities.