

Investigation of Ameliorative Effect of a Polyphenolic Compound of Green Tea Extract against Rotenone Induced Neurotoxicity: A Mechanistic Approach

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Abstract : Natural antioxidants have major role in maintenance of health. Green tea extract principally contains epigallocatechin-3-gallate (EGCG), as its abundant antioxidant constituent. Green tea is consumed daily worldwide as antioxidant to combat CNS diseases and has traditional importance also. EGCG has neuroprotective potential in various animal models of Parkinson disease, Alzheimer's disease etc. but its exact mechanism has not been ruled out. The present study has been designed to investigate the anti-inflammatory, antioxidant and mitochondrial modulating mechanism of neuroprotective effect of epigallocatechin-3-gallate against rodent model of rotenone induced Parkinson's disease (PD). The behavioural alterations were assessed by using open field test apparatus, Chatillon's grip strength test apparatus and elevated plus maze for determining the locomotor activity, grip strength and cognition respectively. Biochemically, various parameters to assess oxidative stress, neuroinflammation and neurochemical estimations were performed on rat brain homogenates. A histological examination of rat brain striatum was done to check the neurodegeneration. Epigallocatechin-3-gallate (EGCG) at 10 & 20 mg/kg, were investigated for their neuroprotective potential along with levodopa as a standard agent. Minocycline, a microglial activation inhibitor, was administered alone and in combination with EGCG. EGCG and minocycline produced ameliorative effect against rotenone induced PD like symptoms by significantly reduced behavioral, biochemical and histological alterations. Results of our study reveal the neuroprotective effect of EGCG and minocycline against rotenone induced PD. Results of our study indicate that EGCG exerted neuroprotective effect against rotenone induced PD via its antioxidant, anti-inflammatory and mitochondrial modulating mechanisms and substantiate its previously reported and traditional claims for its use in CNS diseases.

Keywords : antioxidants, neurotoxicity, rotenone, EGCG

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