ABSTRACT

Parkinson's disease (PD) is an age related and progressive neurodegenerative disorder that impacts the substantia nigra region of mid brain. *Cassia fistula* (Amaltas) is highly significant in ethno-medicine, being widely used in Unani, Ayurvedic and traditional medicine. The proposed study aims to investigate the neuroprotective effect of seed and pod extract of *Cassia fistula* (CF) against the rotenone induced Parkinsonism in the mouse model. 36 mice were segregated into 6 groups in this way; vehicle control, rotenone group, *Cassia fistula* Pod extract (CFPE) (100mg+rotenone), *Cassia fistula* Pod extract (CFPE) (200mg+rotenone), *Cassia fistula* seed extract (CFSE)(200mg+rotenone) and Sinemet+rotenone group. Adult male Swiss albino mice were given subcutaneous injections (2.5mg/kg) of rotenone for 3 weeks to induce PD. The phytochemical composition of extract was determined by gas chromatographymass spectrometry (GC-MS) analysis and revealed the presence of multiple biologically active constituents. Motor activity was accessed through the 6 behavioral tests (including the open field test, narrow beam walk test, pole climb down, stepping test, stride length and tail suspension test). Antioxidant levels of brain i.e. lipid peroxidation (LPO), catalase (CAT), glutathione-S-transferase (GST) and reduced glutathione (GSH) levels were measured. Histological examination was carried out to look for the neuronal morphology of substantia nigra region of midbrain stained with H&E. 200mg/kg of pod and seed extract of *Cassia fistula* resulted in significantly better behavioral performance in comparison with 100mg/kg of pod extract and the rotenone group. Rotenone caused significant increase in the LPO levels while reduced CAT, GST and GSH levels were observed. Antioxidant levels of extract treated groups differed non-significantly in comparison with the control group. Mid brain section of extract treated groups showed lesser degeneration of dopaminergic neurons in comparison with the rotenone group. So, the CF extract treatment showed betterment in results behaviorally, biochemically and histologically owing to its therapeutic potential against rotenone induced Parkinsonism.