ABSTRACT

Peripheral nerve injuries (PNIs) are common conditions, affecting millions of people globally. PNI is characterized by loss of sensory, motor and autonomic functions. Extracts of herbal materials show significant therapeutic effects for nerve regeneration. The aim of this research is to evaluate regenerative potential of ethanolic extracts of *Cassia fistula* pods and seeds for nerve regeneration. 30-Male Swiss albino mice were randomly divided into 5 groups (6/cage) to assess the neuroregenerative potential of ethanolic extracts of *Cassia fistula* pods (EthCF-P) and seeds (EthCF-S); Control Group, Vitamin B12 group, EthCF-PL (100 mg/kg) group, EthCF-PH (200mg/kg) group and EthCF-S (200mg/kg) group. Crush injury was induced on sciatic nerve of left limb of all mice. Extracts were administered orally for consecutive 28 days. Sensory and motor functional recovery was monitored by performing different behavioral tests included pinprick test (for sensory recovery), toe-spread test (for motor recovery), sciatic functional index test (for locomotory recovery) and beam walk test (for coordination and balance). Earlier and improved sensory and motor functional recovery was observed in Vitamin B12, EthCF-PL (100mg/kg) and EthCF-PH (200mg/kg) groups. Histological analysis was also performed on regenerating axons and their targeted muscles. Increased myelin sheath thickness and greater number of motor axons reinnervation was observed in Vitamin B12, EthCF-PL (100mg/kg) and EthCF-PH (200mg/kg) groups. Bioactive compounds were identified in *Cassia fistula* pods and seeds extracts after gas chromatography and mass spectrometry (GC-MS) analysis. Collectively, current research suggested that Vitamin B12, EthCF-PL (100mg/kg) and EthCF-PH (200mg/kg) showed increased regenerative potential as compared to EthCF-S (200mg/kg) and control group after sciatic nerve injury. Further studies are still required to understand the underlying mechanism of functional recovery in *Cassia fistula* treatment groups before clinical investigations.