

Abstract

Peripheral nerve injuries are the most common problems leading to the physical disability in the affected person. These injuries lead to partial or complete loss of sensory and motor functions and cause socio-economic burden. Slow axonal regeneration is leading cause of prolonged suffering of injured persons. Current study examines the regenerative potential of aqueous and ethanolic extract of *Acorus calamus* (AC) and *Mentha piperita* (MP) on sciatic nerve crush injury mouse model. Total five groups of mice (n=6-7/group), group 1: vehicle control (mice were given with distilled water), group 2: 100mg/kg (Aqueous AC + MP, 1:1 ratio), group 3: 200mg/kg (Aqueous AC + MP, 1:1 ratio), group 4: 100mg/kg (Ethanolic AC + MP, 1:1 ratio), group 5: 200mg/kg (Ethanolic AC + MP, 1:1 ratio) were used. Pretreatment (7-days prior to surgery) and post-treatment (for 21 days) of extracts was continued on daily basis. Unilateral left sciatic nerve crush injury was performed at mid-thigh region. Behavioral tests for example sciatic functional index (SFI), pinprick assay and toe spread motor reflex were used to observe functional recovery. Behavioral test showed that mice in extract treated groups showed enhanced restoration of functional recovery as compared to vehicle groups. During 2nd and 3rd weeks of dosing, significant results of pinprick and toe spread were seen. SFI results showed that extract treated groups have enhanced rate of recovery at week 2nd and recover almost till 3rd week of dosing. Extent of regeneration of healing nerve and neuromuscular junction restoration was assessed through toluidine blue stained transverse nerve sections and silver nitrate stained gastrocnemius muscle, respectively. Nerve structures seen under the microscope showed increased myelination and augmented neuromuscular junction restoration in extract treated groups as compared to untreated group. It can be concluded that AC and MP can be used in the treatment of peripheral nerve injuries but bioactive components and regeneration associated genes study is necessary.