Abstract

Peripheral nerve injuries (PNI) are among the most prominent health problem. Such injuries may induce partial or complete loss of motor or sensory functions depending upon the extent of nerve damaged. The loss of sensory and motor functions affects the quality of life of affected persons. Currently, the possible solution to this problem is microsurgical repairs or nerve grafting. Many plants have neuro-protective and nerve regeneration capacities. This study was designed to show the effect of *Azadirachta indica* leaf extract on nerve regeneration. In this study, 36 adult male Albino mice were randomly divided into three groups (n=12). All mice were trained for widely used behavioral assessment tests for nerve regeneration. Extract of *Azadirachta indica* (AI) leaves were given orally for 28 days (7 days before injury and 21 days after injury). The sciatic nerve crush injury was performed in all three groups. The first group (control group) mice were administered with distilled water. Methanolic extract of AI (MeAI) was administered orally in low and high dose (250mg/kg, 500 mg/kg) to group 2 and group 3, respectively. Behavioral tests (Sciatic functional index (SFI), toe spread assay and pinprick assay) were performed to estimate the motor or sensory functional recovery. Improved motor and sensory functional recovery was observed during the 2nd and 3rd week of crush injury in MeAI treated groups (LD and HD) when compared with vehicle group. Histological techniques performed on 14th day of crush injury were used to validate our behavioral data. The increase in thickness of myelin sheath was observed in MeAI treated groups as compared to vehicle group (myelin thickness in control group < myelin thickness in LD group < myelin thickness in HD group). Similar trend was observed in muscle histology (number of axon fibers in CTL< number of axon fibers in LD < number of axon fibers in HD). It can be concluded that the *Azdirachta indica* has nerve regeneration potential following crush injury and can be used as a complementary medicine to treat peripheral nerve injuries, however further investigations at molecular level is necessary