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Chitosan-Coated Nanoparticles of *Calotropis Procera* Escalate Functional Rehabilitation in a Mouse Model of Peripheral Nerve Injury

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Abstract

Patients with peripheral nerve injuries (PNIs) struggle with prominent and difficult health issues. These are the most common types of injuries. The majority of peripheral nerve injuries result from trauma and affect the upper limbs. The professionals on the subject of peripheral nerve injury (PNI) include the scientific community, plastic surgeons, neurologists, and neuroscientists. Despite efforts, full functional recovery is still not promised. Many therapeutic plants have demonstrated varying degrees of efficacy and impact on various neurological and other conditions. The function of Chitosan-coated nanoparticles of *Calotropis procera* (*Calotropis procera*/Cht-NPs) was investigated in a mouse model used to sustain peripheral nerve damage. It was the goal of this study. Experimental models of sciatic nerve injury have been developed to study the development of peripheral nerve damage in rodents. The mice were divided evenly into two groups following the acclimation period. While the normal group (group 1) was gavaged with distilled water, the treatment group (group 2) received *C. procera*/Cht-NPs at a dose of 2.5 mg/kg/day. Both groups were given normal chow and ad libitum water. Animals had their right sciatic nerve mechanically crushed. Behavioral analyses (hot plate, grip strength, SFI, and pinprick test) were used to assess the recovery of sensorimotor function. Blood was extracted to evaluate oxidative stress. After the PNI, it was shown that *C. procera*/Cht-NPs assist in the recovery of motor and sensory functions with a statistically significant difference ($p<.05$). It was concluded that *C. procera*/Cht-NPs demonstrate an impact that enhances function restoration. More thorough research for their use as a therapeutic agent is highly suggested.

Key Words: *Peripheral Nerve Injuries (PNI), Sensorimotor function, Oxidative Stress*