

Review

# Therapeutic Potential of Complementary and Alternative Medicines in Peripheral Nerve Regeneration: A Systematic Review

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**Abstract:** Despite the progressive advances, current standards of treatments for peripheral nerve injury do not guarantee complete recovery. Thus, alternative therapeutic interventions should be considered. Complementary and alternative medicines (CAMs) are widely explored for their therapeutic value, but their potential use in peripheral nerve regeneration is underappreciated. The present systematic review, designed according to guidelines of Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols, aims to present and discuss the current literature on the neuroregenerative potential of CAMs, focusing on plants or herbs, mushrooms, decoctions, and their respective natural products. The available literature on CAMs associated with peripheral nerve regeneration published up to 2020 were retrieved from PubMed, Scopus, and Web of Science. According to current literature, the neuroregenerative potential of *Achyranthes bidentata*, *Astragalus membranaceus*, *Curcuma longa*, *Panax ginseng*, and *Hericium erinaceus* are the most widely studied. Various CAMs enhanced proliferation and migration of Schwann cells *in vitro*, primarily through activation of MAPK pathway and FGF-2 signaling, respectively. Animal studies demonstrated the ability of CAMs to promote peripheral nerve regeneration and functional recovery, which are partially associated with modulations of neurotrophic factors, pro-inflammatory cytokines, and anti-apoptotic signaling. This systematic review provides evidence for the potential use of CAMs in the management of peripheral nerve injury.

**Keywords:** complementary and alternative medicines; natural products; peripheral nerve injury; nerve repair; nerve regeneration; functional recovery

## 1. Introduction

Peripheral nerve injury (PNI) can result in partial or total loss of motor, sensory and autonomic functions at denervated regions, leading to temporary or life-long disability [1]. In addition to reduced quality of life, functional deficits from PNI have a substantial economic impact on the affected individuals [2]. A recent study found that, over nine years (from 2009 to 2018), more than 550,000 individuals were afflicted by PNI in the United