

Effect of curcumin (*Curcuma longa*, Zingiberaceae) against sciatic nerve ligation induced behavioral and biochemical alterations: Possible involvement of nitric oxide mechanism

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Introduction: Neuropathic pain represents a real clinical challenge because of its severity, chronic nature, and inadequate drug therapy. Recently, nitric oxide pathway has been proposed in the pathogenesis neuropathic pain like conditions. Curcumin, obtained from the rhizome of *Curcuma longa*, is a well known for its antioxidant and medicinal values. The objective of the present study was to explore possible nitric oxide mechanism in the protective effect of curcumin against sciatic nerve ligation induced behavioral and biochemical alterations in rats

Materials and Methods: Sciatic nerve ligation was performed in Wistar male rats. Various behavioral parameters (thermal hyperalgesia, cold allodynia) followed by assessment of biochemical parameters (lipid peroxidation, reduced glutathione, catalase, and nitrite) both on sciatic nerves and brain. Drugs treatment was given consecutively for 21 days from the day of surgery.

Results: Sciatic nerve ligation (SNL) significantly caused thermal hyperalgesia, cold allodynia and oxidative damage as compared to sham (Sciatic nerve without ligation) and naïve animals. Chronic administration of curcumin (20 mg/kg, po) significantly reversed hyperalgesia, cold allodynia and attenuated oxidative damage (as indicated by reduced lipid peroxidation, nitric concentration, restoration of reduced glutathione and catalase activity) in both sciatic nerve as well as brain as compared to control (SNL). Further, L-NAME (5 mg/kg) (nitric oxide synthase inhibitor) pretreatment with curcumin (10 mg/kg, po) potentiated protective effect of curcumin as compared to their effect per se in both sciatic nerve as well as brain. However, L-arginine (100 mg/kg) (nitric oxide precursor) pretreatment with curcumin (10 mg/kg, po) significantly reversed the protective effects of curcumin in both sciatic nerve as well as in brain.

Conclusion- Result of present study suggests that nitric oxide mechanism could be involved in the protective effect of curcumin against SNL induced behavior and biochemical alterations in rats.