

# Curcumin provides neuroprotection after spinal cord injury

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摘要

## Abstract

**BACKGROUND:** Traumatic spinal cord injury (SCI) is a major cause of long-term disability. However, therapeutic agents targeting SCI are sorely lacking. The aim of this study was to investigate whether curcumin has neuroprotective effects after SCI in rats. **MATERIALS AND METHODS:** Studies were performed in 39 male Sprague-Dawley rats after spinal cord hemisection. The animals were randomly divided into three groups: sham, vehicle, and curcumin. The Basso, Beattie, and Bresnahan (BBB) scale was used to evaluate functional outcome. Specimens were tested for histologic, terminal deoxynucleotidyl transferase-mediated deoxyuridine triphosphate nick-end labeling (TUNEL), and immunohistochemical staining. Primary cultured astrocytes were used to test the inhibitory effect of curcumin on glial reactivation. **RESULTS:** The BBB scores for the affected hindlimb after hemisection were significantly improved in the curcumin-treated group compared with the vehicle group (on d 3 and 7;  $P < 0.001$ ). Immunohistochemistry of NeuN revealed remarkable neuronal loss in the vehicle group after hemisection. In comparison, curcumin significantly protected neurons after SCI (curcumin compared with vehicle;  $P < 0.001$ ). Furthermore, curcumin significantly attenuated apoptosis after SCI (curcumin compared with vehicle;  $P < 0.001$ ). RT-PCR demonstrated that the expression of glial fibrillary acidic protein (GFAP) was significantly inhibited by curcumin. **CONCLUSIONS:** Curcumin inhibited apoptosis and neuron loss, quenched astrocyte activation, and significantly improved neurologic deficit 7 d after spinal cord hemisection. By down-regulating GFAP expression, curcumin seems to attenuate astrocyte reactivation, which may be beneficial for neuronal survival. This is the first report demonstrating the successful treatment of SCI by curcumin. Copyright © 2009 Elsevier Inc. All rights reserved.