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Abstract

Cannabidiol-treated rats exhibited higher motor score after cryogenic spinal cord injury.

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Abstract

Cannabidiol (CBD), a non-psychoactive constituent of cannabis, has been reported to induce neuroprotective effects in several experimental models of brain injury. We aimed at investigating whether this drug could also improve locomotor recovery of rats submitted to spinal cord cryoinjury. Rats were distributed into five experimental groups. Animals were submitted to laminectomy in vertebral segment T10 followed or not by application of liquid nitrogen for 5 s into the spinal cord at the same level to cause cryoinjury. The animals received injections of vehicle or CBD (20 mg/kg) immediately before, 3 h after and daily for 6 days after surgery. The Basso, Beattie, and Bresnahan motor evaluation test was used to assess motor function post-lesion one day before surgery and on the first, third, and seventh postoperative days. The extent of injury was evaluated by hematoxylin-eosin histology and FosB expression. Cryogenic lesion of the spinal cord resulted in a significant motor deficit. Cannabidiol-treated rats exhibited a higher Basso, Beattie, and Bresnahan locomotor score at the end of the first week after spinal cord injury: lesion + vehicle, day 1: zero, day 7: four, and lesion + Cannabidiol 20 mg/kg, day 1: zero, day 7: seven. Moreover, at this moment there was a significant reduction in the extent of tissue injury and FosB expression in the ventral horn of the spinal cord. The present study confirmed that application of liquid nitrogen to the spinal cord induces reproducible and quantifiable spinal cord injury associated with locomotor function impairments. Cannabidiol improved locomotor functional recovery and reduced injury extent, suggesting that it could be useful in the treatment of spinal cord lesions.

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