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Curcumin blocks chronic morphine analgesic tolerance and brain-derived neurotrophic factor upregulation.

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Abstract

This study was carried out based on the assumption that brain-derived neurotrophic factor (BDNF) may counterbalance the action of morphine in the brain. Morphine analgesic tolerance after daily administrations for six days was blocked by intracerebroventricular injection of anti-BDNF IgG on day 5, but not by administrations on days 1-4. Chronic morphine treatment significantly increased the expression of exon I and IV BDNF transcripts, indicating differential regulation of BDNF gene expression. Daily administration of the CREB-binding protein inhibitor curcumin abolished the upregulation of BDNF transcription and morphine analgesic tolerance. These results suggest that curcumin might be a promising adjuvant to reduce morphine analgesic tolerance, and that epigenetic control could be a new strategy useful for the control of this problem.

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