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Honokiol Exerts Antidepressant Effects in Rats Exposed to Chronic Unpredictable Mild Stress by Regulating Brain Derived Neurotrophic Factor Level and Hypothalamus-Pituitary-Adrenal Axis Activity.

Wang C¹, Gan D², Wu J³, Liao M², Liao X¹, Ai W⁴.

Author information

Abstract

Honokiol (HNK), the main active component of *Magnolia officinalis*, has shown a variety of pharmacological activities. In the present study, we measured the antidepressant-like effects of HNK in a rat model of chronic unpredictable mild stress (CUMS) and explored its possible mechanisms. The antidepressant-like effects of HNK were assessed in rats by an open field test (OFT), sucrose preference test (SPT) and forced swimming test (FST). Then, serum levels of corticotrophin-releasing hormone (CRH), adrenocorticotrophic hormone (ACTH) and corticosterone (CORT) and hippocampal brain-derived neurotrophic factor (BDNF) and glucocorticoid receptor α (GR α) levels were assessed to explore the possible mechanisms. We identified that HNK treatment (2, 4, and 8 mg/kg) alleviated the CUMS-induced behavioural deficits. Treatment with HNK also normalized the CUMS-induced hyperactivity of the limbic hypothalamic-pituitary-adrenal (HPA) axis, as indicated by reduced CRH, ACTH and CORT serum levels. In addition, HNK increased the expression of GR α (mRNA and protein) and BDNF (mRNA and protein) in the hippocampus. These data confirmed the antidepressant-like effects of HNK, which may be related to its normalizing the function of the HPA axis and increasing the BDNF level in the hippocampus.

KEYWORDS: Antidepressant; Brain-derived neurotrophic factor (BDNF); Chronic unpredictable mild stress (CUMS); Honokiol; Hypothalamic–pituitary–adrenal (HPA) axis

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