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Biomed Environ Sci. 2009 Aug;22(4):318-26.

Pretreatment with Rhodiola rosea extract reduces cognitive impairment induced by intracerebroventricular streptozotocin in rats: implication of anti-oxidative and neuroprotective effects.

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Abstract

OBJECTIVE: To investigate the pretreatment effects of **Rhodiola rosea** (*R. rosea*) extract on cognitive dysfunction, oxidative stress in hippocampus and hippocampal neuron injury in a rat model of Alzheimer's disease (AD).

METHODS: Male Sprague-Dawley rats were pretreated with *R. rosea* extract at doses of 1.5, 3.0, and 6.0 g/kg for 3 weeks, followed by bilateral intracerebroventricular injection with streptozotocin (1.5 mg/kg) on days 1 and 3. Behavioral alterations were monitored after 2 weeks from the lesion using Morris water maze task. Three weeks after the lesion, the rats were sacrificed for measuring the malondialdehyde (MDA), glutathione reductase (GR) and reduced glutathione (GSH) levels in hippocampus and histopathology of hippocampal neurons.

RESULTS: The MDA level was significantly increased while the GR and GSH levels were significantly decreased with striking impairments in spatial learning and memory and severe damage to hippocampal neurons in the model rat induced by intracerebroventricular injection of streptozotocin. These abnormalities were significantly improved by pretreatment with *R. rosea* extract (3.0 g/kg).

CONCLUSION: *R. rosea* extract can protect rats against cognitive deficits, neuronal injury and oxidative stress induced by intracerebroventricular injection of streptozotocin, and may be used as a potential agent in treatment of neurodegenerative diseases such as AD.

PMID: 19950527 [PubMed - indexed for MEDLINE]

MeSH Terms, Substances

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