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Hydrogen-rich saline reduces oxidative stress and inflammation by inhibit of JNK and NF-κB activation in a rat model of amyloid-beta-induced Alzheimer's disease

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Abstract

This study is to examine if hydrogen-rich saline reduced amyloid-beta (Aβ) induced neural inflammation and oxidative stress in a rat model by attenuation of activation of JNK and NF-κB. Sprague-Dawley male rats (n=18, 280-330 g) were divided into three groups, sham operated, Aβ1-42 injected and Aβ1-42 plus hydrogen-rich saline treated animals. Hydrogen-rich saline (5 ml/kg, i.p., daily) was injected for 10 days after intraventricular injection of Aβ1-42. The levels of IL-1β were assessed by ELISA analysis, 8-OH-dG by immunohistochemistry in the brain slides, and JNK and NF-κB by immunohistochemistry and western blotting. After Aβ1-42 injection, the level of IL-1β, 8-OH-dG, JNK and NF-κB all increased in brain tissues, while hydrogen-rich saline treatment decreased the level of IL-1β, 8-OH-dG and the activation of JNK and NF-κB. In conclusion, hydrogen-rich saline prevented Aβ-induced neuroinflammation and oxidative stress, possibly by attenuation of activation of c-Jun NH_2-terminal kinase (JNK) and nuclear factor-κB (NF-κB) in this rat model.

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