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Protective Effects of Hydrogen-Rich Saline on Rats with Smoke Inhalation Injury

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Abstract

Objective: To explore the protective effects of hydrogen-rich saline on rats with smoke inhalation injury.

Methods: 36 healthy male Sprague-Dawley rats were randomly divided into 3 groups (n = 12 per group): sham group (S), inhalation injury plus normal saline treatment group (I+NS), and inhalation injury plus hydrogen-rich saline treatment group (I+HS). 30 min after injury, normal saline and hydrogen-rich saline were injected intraperitoneally (5 mL/kg) in I+NS group and I+HS group, respectively. All rats were euthanized and blood and organ specimens were collected for determination 24 h after inhalation injury.

Results: Tumor necrosis factor-alpha (TNF-α) levels, malondialdehyde (MDA) concentrations, nuclear factor kappa B (NF-κB) p65 expression, and apoptosis index (AI) in I+HS group were significantly decreased ($P < 0.05$), while superoxide dismutase (SOD) activities were increased compared with those in I+NS group; and a marked improvement in alveolar structure was also found after hydrogen-rich saline treatment.

Conclusions: Hydrogen-rich saline treatment exerts protective effects in acute lung injury induced by inhalation injury, at least in part through the activation of anti-inflammatory and antioxidant pathways and inhibition of apoptosis.

Figures

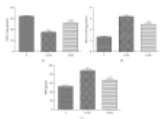

Figure 1 Hydrogen treatment upregulated the activities...

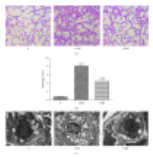

Figure 2 Hydrogen-rich saline treatment attenuated ALI...

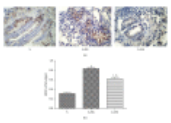

Figure 3 Hydrogen treatment inhibited the lung...

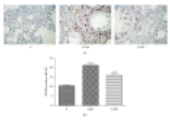

Figure 4 Hydrogen treatment prevented the lung...

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