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Effects of hydrogen-rich saline on aquaporin 1, 5 in septic rat lungs

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Abstract

Aquaporin 1(AQP1) and AQP5 have an important role in eliminating extravascular lung water, an increase of which contributes to lung injury in patients with sepsis and its consequent mortality. It has been reported that hydrogen-rich saline (HRS) has protective effects against sepsis-related lung injury. In this study, we hypothesized that the protective effect occurred by preserving the expression of AQP1 and AQP5. To test this hypothesis, male Sprague-Dawley rats received intratracheal administration of lipopolysaccharide (LPS) followed by intraperitoneal injection of HRS. Lung function, wet-to-dry weight ratio, and histopathology scores were determined. The expression of AQP1 and AQP5 at the messenger RNA and protein levels, as well as the involved pathways, was explored by quantitative polymerase chain reaction and Western blot. LPS significantly impaired lung function and downregulated the expression of AQP1 and AQP5 in the rat lung, all of which were attenuated by HRS treatment. Moreover, HRS treatment inhibited LPS-induced activation of p38 mitogen-activated protein kinase and jun N-terminal kinase, which is associated with LPS-induced downregulation of AQP1 and AQP5.

Keywords: Acute lung injury; Aquaporin 1; Aquaporin 5; Hydrogen; Sepsis.

Related information

GEO Profiles
Gene
Gene (GeneRIF)
Nucleotide (RefSeq)
Nucleotide (RefSeq)
Nucleotide (Weighted)
Protein (RefSeq)
Protein (Weighted)
PubChem Compound (MeSH Keyword)
Taxonomy via GenBank
UniGene

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