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Molecular mechanisms underlying the protective effects of hydrogen-saturated saline on noise-induced hearing loss

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Erratum in

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Abstract

Objectives: This study aimed to explore the molecular mechanism of the protective effects of hydrogen-saturated saline on NIHL.

Methods: Guinea pigs were divided into three groups: hydrogen-saturated saline; normal saline; and control. For saline administration, the guinea pigs were given daily abdominal injections 3 d before and 1 h before noise exposure. ABR were tested to examine cochlear physiology changes. The changes of 8-hydroxy-desoxyguanosine (8-HOdG), interleukin-1 (IL-1), interleukin-6 (IL-6), interleukin-10 (IL-10), tumor necrosis factor-α (TNF-α), intercellular cell adhesion molecule-1 (ICAM-1) and high mobility group box-1 protein (HMGB1) in the cochlea were also examined.

Results: The results showed that pre-treatment with hydrogen-saturated saline could significantly attenuate noise-induced hearing loss. The concentration of 8-HOdG was also significantly decreased in the hydrogen-saturated saline group compared with the normal saline group. After noise exposure, the concentrations of IL-1, IL-6, TNF-α, and ICAM-1 in the cochlea of guinea pigs in the hydrogen-saturated saline group were dramatically reduced compared to those in the normal saline group. The concentrations of HMGB-1 and IL-10 in the hydrogen-saturated saline group were significantly higher than in those in the normal saline group immediately and at 7 d after noise exposure.

Conclusions: This study revealed for the first time the protective effects of hydrogen-saturated saline on noise-induced hearing loss (NIHL) are related to both the anti-oxidative activity and anti-inflammatory activity.

Keywords: Hydrogen-saturated saline; anti-inflammatory; anti-oxidative; noise-induced hearing loss.

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