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Preventive Effects of Drinking Hydrogen-Rich Water on Gingival Oxidative Stress and Alveolar Bone Resorption in Rats Fed a High-Fat Diet

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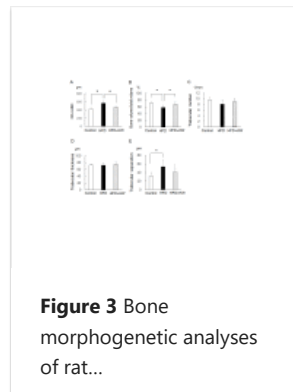
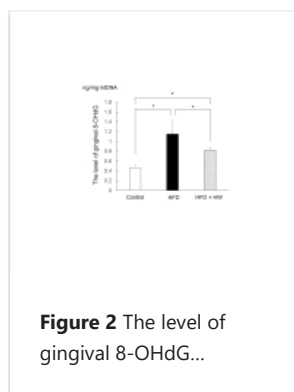
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Abstract

Obesity induces gingival oxidative stress, which is involved in the progression of alveolar bone resorption. The antioxidant effect of hydrogen-rich water may attenuate gingival oxidative stress and prevent alveolar bone resorption in cases of obesity. We examined whether hydrogen-rich water could suppress gingival oxidative stress and alveolar bone resorption in obese rats fed a high-fat diet. Male Fischer 344 rats ($n = 18$) were divided into three groups of six rats each: a control group (fed a regular diet and drinking distilled water) and two experimental groups (fed a high-fat diet and drinking distilled water or hydrogen-rich water). The level of 8-hydroxydeoxyguanosine was determined to evaluate oxidative stress. The bone mineral density of the alveolar bone was analyzed by micro-computerized tomography. Obese rats, induced by a high-fat diet, showed a higher gingival level of 8-hydroxydeoxyguanosine and a lower level of alveolar bone density compared to the control group. Drinking hydrogen-rich water suppressed body weight gain, lowered gingival level of 8-hydroxydeoxyguanosine, and reduced alveolar bone resorption in rats on a high-fat diet. The results indicate that hydrogen-rich water could suppress gingival oxidative stress and alveolar bone resorption by limiting obesity.

Keywords: alveolar bone loss; animal disease model; hydrogen-rich water; obesity; oxidative stress.

Figures



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