

Consumption of hydrogen water prevents atherosclerosis in apolipoprotein E knockout mice

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Abstract

Oxidative stress is implicated in atherogenesis; however most clinical trials with dietary antioxidants failed to show marked success in preventing atherosclerotic diseases. We have found that hydrogen (dihydrogen; H₂) acts as an effective antioxidant to reduce oxidative stress [I. Ohsawa, M. Ishikawa, K. Takahashi, M. Watanabe, K. Nishimaki, K. Yamagata, K. Katsura, Y. Katayama, S. Asoh, S. Ohta, Hydrogen acts as a therapeutic antioxidant by selectively reducing cytotoxic oxygen radicals, Nat. Med. 13 (2007) 688–694]. Here, we investigated whether drinking H₂-dissolved water at a saturated level (H₂-water) *ad libitum* prevents arteriosclerosis using an apolipoprotein E knockout mouse (apoE^{-/-}), a model of the spontaneous development of atherosclerosis. ApoE^{-/-} mice drank H₂-water *ad libitum* from 2 to 6 month old throughout the whole period. Atherosclerotic lesions were significantly reduced by *ad libitum* drinking of H₂-water ($p = 0.0069$) as judged by Oil-Red-O staining series of sections of aorta. The oxidative stress level of aorta was decreased. Accumulation of macrophages in atherosclerotic lesions was confirmed. Thus, consumption of H₂-dissolved water has the potential to prevent arteriosclerosis.

Keywords: Antioxidant; ApoE; Arteriosclerosis; Atherogenesis; Dihydrogen; Lifestyle-related disease; Macrophage; Molecular hydrogen; Oxidative stress; Preventive medicine

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