IJCM> Vol.7 No.1, January 2016 21

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Clinical Effects of Hydrogen Administration: From Animal and Human Diseases to Exercise Medicine

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ABSTRACT

Here we review the literature on the effects of molecular hydrogen (H_2) on normal human subjects and patients with a variety of diagnoses, such as metabolic, rheumatic, cardiovascular and neurodegenerative and other diseases, infections and physical and radiation damage as well as effects on aging and exercise. Although the effects of H_2 have been studied in multiple animal models of human disease, such studies will not be reviewed in depth here. H_2 can be administered as a gas, in saline implants or infusions, as topical solutions or baths or by drinking H_2-enriched water. This latter method is the easiest and least costly method of administration. There are no safety issues with hydrogen; it has been used for years in gas mixtures for deep diving and in numerous clinical trials without adverse events, and there are no warnings in the literature of its toxicity or long-term exposure effects. Molecular hydrogen has proven useful and convenient as a novel antioxidant and modifier of gene expression in many conditions where oxidative stress and changes in gene expression result in cellular damage.

KEYWORDS

Anti-Oxidant, Hydrogen Therapy, Gene Regulation, Gamates, Inflammatory Disease, Neurodegenerative Disease, Rheumatic Disease, Infections, Aging, Exercise, Metabolic Disease, Ischemia, Cardiovascular Disease, Neuromuscular Disease, Radiation, Skin, Sepsis

Cite this paper

Nicolson, G. , de Mattos, G. , Settineri, R. , Costa, C. , Ellithorpe, R. , Rosenblatt, S. , La Valle, J. , Jimenez, A. and Ohta, S. (2016) Clinical Effects of Hydrogen Administration: From Animal and Human Diseases to Exercise Medicine. *International Journal of Clinical Medicine*, **7**, 32-76. doi: 10.4236/ijcm.2016.71005.

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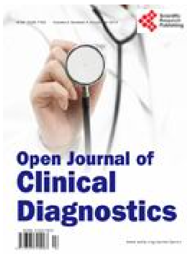

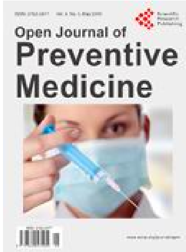

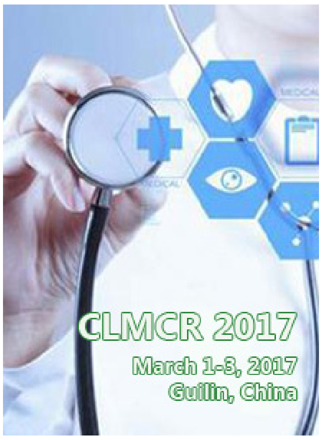

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