

POTENTIAL EFFECTS OF HYDROGEN WATER OVER USUAL CONCENTRATION OF DISSOLVED HYDROGEN

R. A. Amir¹

¹Centre de Santé des Fagnes, Chimay, Belgium

Regulation of cellular redox balance is important for the maintenance of human body integrity. Many important diseases, such as ischemia, cancer, inflammation, neurological disorders, metabolic diseases and others, also ageing are known to be associated with increased reactive oxygen species (ROS) production. ⁽¹⁾ The different routes of molecular hydrogen (H₂) administration in animal model and human clinical studies are usually classified into three types: inhalation of H₂ gas, drinking H₂ dissolved water and injection of H₂ dissolved saline. The redox imbalance between nitric oxide and superoxide generated in the vascular endothelium is thought to play a significant role in the development of endothelial dysfunction. It is well known that H₂ neutralizes detrimental ROS, especially the hydroxyl radical. Endothelial dysfunction may cause accumulation of vascular damage and induces chronic inflammation, followed by other potential complications. Recently, it was demonstrated that H₂ has a therapeutic potential against chronic inflammatory diseases, including rheumatoid arthritis. ⁽²⁾ The concentration of exogenous H₂ in the body and its therapeutic efficacy have been previously studied and discussed in several studies. ^(3, 4) H₂ gas is generated endogenously in human intestines by commensal bacteria and a small amount of absorbed H₂ is detectable in exhaled air. These observations are indicative of safety of H₂ gas. More recent study has suggested that consumption of water containing over 3,5 mg of dissolved H₂ could improve vascular endothelial function. ⁽⁵⁾ It has been demonstrated that H₂ has the capability to act at the cellular level, and is qualified to cross the blood brain barrier and even to enter the mitochondria. Once in these ideal locations of cell, previous studies have shown that H₂ exerts antioxidant, anti-apoptotic, anti-inflammatory and cytoprotective properties that are beneficial to the cell. Many recent studies confirm more and more than H₂ may become in the future a novel therapeutic treatment or an adjuvant tool which may be useful when associated with other treatment or may have a protective effect on liver function of colorectal patients treated with mFolfox6 chemotherapy. Moreover, radiation may induces tissue injury at the cellular level. To protect healthy tissue surrounding tumor, H₂ may afford effective protection. ⁽⁶⁾

References:

1. Majzunova M et al. J Biomed Sci 2013;20:69
2. Ishibashi T et al. Med Gas Res 2012;2:27
3. Ohno K et al. Oxid Med Cell Longev 2012;2012:353152
4. Ono H et al. Med Gas Res 2012;2:21
5. Sakai T et al. Vasc Health Risk Manag 2014;10:591
6. Kang K-M et al. Med Gas Res 2011;1:11