

CONSUMPTION OF WATER CONTAINING A HIGH CONCENTRATION OF MOLECULAR HYDROGEN REDUCES OXIDATIVE STRESS AND DISEASE ACTIVITY IN PATIENTS WITH RHEUMATOID ARTHRITIS: AN OPEN-LABEL PILOT STUDY

Ishibashi T, Sato B, Rikitake M, Seo T, Kurokawa R, Hara Y, Naritomi Y, Hara H, Nagao T.

Source

Haradoi Hospital, Department of Rheumatology and Orthopaedic Surgery, 6-40-8 Aoba, Higashi-ku, Fukuoka 813-8588, Japan.

Abstract

BACKGROUND: Rheumatoid arthritis (RA) is a chronic inflammatory disease characterized by the destruction of bone and cartilage. Although its etiology is unknown, the hydroxyl radical has been suggested to be involved in the pathogenesis of RA. Recently, molecular hydrogen (H₂) was demonstrated to be a selective scavenger for the hydroxyl radical. Also, the method to prepare water containing extremely high concentration of H₂ has been developed. We hypothesized that H₂ in the water could complement conventional therapy by reducing the oxidative stress in RA.

METHODS: Twenty patients with rheumatoid arthritis (RA) drank 530 ml of water containing 4 to 5 ppm molecular hydrogen (high H₂ water) every day for 4 weeks. After a 4-week wash-out period, the patients drank the high H₂ water for another 4 weeks. Urinary 8-hydroxydeoxyguanine (8-OHdG) and disease activity (DAS28, using C-reactive protein [CRP] levels) was estimated at the end of each 4-week period.

RESULTS: Drinking high H₂ water seems to raise the concentration of H₂ more than the H₂ saturated (1.6 ppm) water in vivo. Urinary 8-OHdG was significantly reduced by 14.3% ($p < 0.01$) on average. DAS28 also decreased from 3.83 to 3.02 ($p < 0.01$) during the same period. After the wash-out period, both the urinary 8-OHdG and the mean DAS28 decreased, compared to the end of the drinking period. During the second drinking period, the mean DAS28 was reduced from 2.83 to 2.26 ($p < 0.01$). Urinary 8-OHdG was not further reduced but remained below the baseline value. All the 5 patients with early RA (duration < 12 months) who did not show antibodies against cyclic citrullinated peptides (ACPs) achieved remission, and 4 of them became symptom-free at the end of the study.

CONCLUSIONS: The results suggest that the hydroxyl radical scavenger H₂ effectively reduces oxidative stress in patients with this condition. The symptoms of RA were significantly improved with high H₂ water.

PMID:23031079[PubMed] PMCID:PMC3563451

PubMed: National Center for Biotechnology Information (NCBI) is a division of the U.S. National Library of Medicine (NLM) at the National Institutes of Health (NIH).

PREPARED BY: www.OpenMindNetwork.com
[Contact Us For More Information.](#)

MOLECULAR HYDROGEN: NEW ANTIOXIDANT AND ANTI-INFLAMMATORY THERAPY FOR RHEUMATOID ARTHRITIS AND RELATED DISEASES

Toru Ishibashi

Source

Haradoi Hospital, Department of Rheumatology and Orthopaedic Surgery,
6-40-8 Aoba, Higashi-ku, Fukuoka 813-8588, Japan.

Abstract

Rheumatoid arthritis (RA) is a chronic inflammatory disease in which the progressive destruction of joint causes morbidity. It is also associated with an increased risk of atherosclerosis, which can result in cardiovascular disease and mortality. The therapeutic goal is to control the systemic inflammation to obtain not only the remission of symptoms, but also improve general state of health. Although recent biologic immunosuppressive therapies targeting pro-inflammatory cytokines have spawned a paradigm shift regarding the prognosis of RA, these therapies possess inherent side effects. Also, early diagnosis of the disease remains confounded by uncertainty. While the mechanisms responsible for the onset of RA remain unclear, reactive oxygen species (ROS) play a significant role in the pathogenesis of RA. ROS play a central role both upstream and downstream of NF- κ B and TNF α pathways, which are located at the center of the inflammatory response. Among the ROS, the hydroxyl radical is the most harmful, and molecular hydrogen (H₂) is a selective scavenger for this species. Recently, it has been shown that H₂ is useful when administered along with the conventional therapy in RA as it acts to reduce oxidative stress in the patients. Especially in the early stage, H₂ showed significant therapeutic potential, which also seemed to assist diagnosis and treatment decisions of RA. The possible expectations regarding the potential benefits of H₂ by reducing the oxidative stress, resulting from inflammatory factors, are raised and discussed here. They include prevention of RA and related atherosclerosis, as well as therapeutic validity for RA.

PMID: 23859555 [PubMed - indexed for MEDLINE] PMCID: PMC3788323

PubMed: National Center for Biotechnology Information (NCBI) is a division of the U.S. National Library of Medicine (NLM) at the National Institutes of Health (NIH).

PREPARED BY: www.OpenMindNetwork.com
[Contact Us For More Information.](#)

MOLECULAR HYDROGEN AS A PREVENTIVE AND THERAPEUTIC MEDICAL GAS: INITIATION, DEVELOPMENT AND POTENTIAL OF HYDROGEN MEDICINE

Ohta S. Pharmacol Ther. 2014 Apr 24. pii: S0163-7258(14)00094-1. doi: 10.1016/j.pharmthera.2014.04.006.

Source

Department of Biochemistry and Cell Biology, Institute of Development and Aging Sciences, Graduate School of Medicine, Nippon Medical School, 1-396 Kosugi-machi, Nakahara-ku, Kawasaki-city, Kanagawa-ken, 211-8533 Japan.

Abstract

Molecular hydrogen (H₂) has been accepted to be an inert and nonfunctional molecule in our body. We have turned this concept by demonstrating that H₂ reacts with strong oxidants such as hydroxyl radical in cells, and proposed its potential for preventive and therapeutic applications. H₂ has a number of advantages exhibiting extensive effects: H₂ rapidly diffuses into tissues and cells, and it is mild enough neither to disturb metabolic redox reactions nor to affect signaling reactive oxygen species; therefore, there should be no or little adverse effects of H₂. There are several methods to ingest or consume H₂; inhaling H₂ gas, drinking H₂-dissolved water (H₂-water), injecting H₂-dissolved saline (H₂-saline), taking an H₂ bath, or dropping H₂-saline into the eyes. The numerous publications on its biological and medical benefits revealed that H₂ reduces oxidative stress not only by direct reactions with strong oxidants, but also indirectly by regulating various gene expressions. Moreover, by regulating the gene expressions, H₂ functions as an anti-inflammatory and anti-apoptotic, and stimulates energy metabolism. In addition to growing evidence obtained by model animal experiments, extensive clinical examinations were performed or are under investigation. Since most drugs specifically act to their targets, H₂ seems to differ from conventional pharmaceutical drugs. Owing to its great efficacy and lack of adverse effects, H₂ has promising potential for clinical use against many diseases.

PMID:24769081[PubMed]

PubMed: National Center for Biotechnology Information (NCBI) is a division of the U.S. National Library of Medicine (NLM) at the National Institutes of Health (NIH).

PREPARED BY: www.OpenMindNetwork.com
[Contact Us For More Information.](#)