PubMed Studies Hydrogen Rich Water

Effectiveness of Hydrogen Rich Water on Antioxidant Status of Subjects with Potential Metabolic Syndrome—An Open Label Pilot Study

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http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2831093/

Abstract
Metabolic syndrome is characterized by cardiometabolic risk factors that include obesity, insulin resistance, hypertension and dyslipidemia. Oxidative stress is known to play a major role in the pathogenesis of metabolic syndrome. The objective of this study was to examine the effectiveness of hydrogen rich water (1.5–2 L/day) in an open label, 8-week study on 20 subjects with potential metabolic syndrome. Hydrogen rich water was produced, by placing a metallic magnesium stick into drinking water (hydrogen concentration; 0.55–0.65 mM), by the following chemical reaction; $Mg + 2H_2O \rightarrow Mg(OH)_2 + H_2$. The consumption of hydrogen rich water for 8 weeks resulted in a 39% increase ($p<0.05$) in antioxidant enzyme superoxide dismutase (SOD) and a 43% decrease ($p<0.05$) in thiobarbituric acid reactive substances (TBARS) in urine. Further, subjects demonstrated an 8% increase in high density lipoprotein (HDL)-cholesterol and a 13% decrease in total cholesterol/HDL-cholesterol from baseline to week 4. There was no change in fasting glucose levels during the 8 week study. In conclusion, drinking hydrogen rich water represents a potentially novel therapeutic and preventive strategy for metabolic syndrome. The portable magnesium stick was a safe, easy and effective method of delivering hydrogen rich water for daily consumption by participants in the study.

Supplementation of hydrogen-rich water improves lipid and glucose metabolism in patients with type 2 diabetes or impaired glucose tolerance.

Kajiyama S[1], Hasegawa G, Asano M, Hosoda H, Fukui M, Nakamura N, Kitawaki J, Imai S, Nakano K, Ohta M, Adachi T, Obayashi H, Yoshikawa T.
http://www.ncbi.nlm.nih.gov/pubmed/19083400

Abstract
Oxidative stress is recognized widely as being associated with various disorders including diabetes, hypertension, and atherosclerosis. It is well established that hydrogen has a reducing action. We therefore investigated the effects of hydrogen-rich water intake on lipid and glucose metabolism in patients with either type 2 diabetes mellitus (T2DM) or impaired glucose tolerance (IGT). We performed a randomized, double-blind, placebo-controlled, crossover study in 30 patients with T2DM controlled by diet and exercise therapy and 6 patients with IGT. The patients consumed either 900 mL/d of hydrogen-rich pure water or 900 mL of placebo pure water for 8 weeks, with a 12-week washout period. Several biomarkers of oxidative stress, insulin resistance, and glucose metabolism, assessed by an oral glucose tolerance test, were evaluated at baseline and at 8 weeks. Intake of hydrogen-rich water was associated with significant decreases in the levels of modified low-density lipoprotein (LDL) cholesterol (i.e., modifications that increase the net negative charge of LDL), small dense LDL, and urinary 8-isoprostanes by 15.5% ($P < .01$), 5.7% ($P < .05$), and 6.6% ($P < .05$), respectively. Hydrogen-rich water intake was also associated with a trend of decreased serum concentrations of oxidized LDL and free fatty acids, and increased plasma levels of adiponectin and extracellular-superoxide dismutase. In 4 of 6 patients with IGT, intake of hydrogen-rich water normalized the oral glucose tolerance test. In conclusion, these results suggest that supplementation with hydrogen-rich water may have a beneficial role in prevention of T2DM and insulin resistance.

Hydrogen-rich water affected blood alkalinity in physically active men.

Ostojic SM[1], Stojanovic MD.
http://www.ncbi.nlm.nih.gov/pubmed/24392771

Abstract
Possible appliance of effective and safe alkalizing agent in the treatment of metabolic acidosis could be of particular interest to humans experiencing an increase in plasma acidity, such as exercise-induced acidosis. In the present study we tested the hypothesis that the daily oral intake of 2L of hydrogen-rich water (HRW) for 14 days would increase arterial blood alkalinity at baseline and post-exercise as compared with the placebo. This study was a randomized, double blind, placebo-controlled trial involving 52 presumably healthy physically active male volunteers. Twenty-six participants received HRW and 26 a placebo (tap water) for 14 days. Arterial blood pH, partial pressure for carbon dioxide (pCO2), and bicarbonates were measured at baseline and postexercise at the start (day 0) and at the end of the intervention period (day 14). Intake of HRW significantly increased fasting arterial blood pH by 0.04 (95% confidence interval; 0.01 - 0.08; $p < 0.001$), and postexercise pH by 0.07 (95% confidence interval; 0.01 - 0.10; $p = 0.03$) after 14 days of intervention. Fasting bicarbonates were significantly higher in the HRW trial after the administration regimen as compared with the preadministration (30.5 ± 1.9 mEq/L vs. 28.3 ± 2.3 mEq/L; $p < 0.0001$). No volunteers withdrew before the end of the study, and no participant reported any vexatious side effects of supplementation. These results support the hypothesis that HRW administration is safe and may have an alkalizing effect in young physically active men.