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A double-blind, placebo-controlled study of the short term effects of a spring water supplemented with magnesium bicarbonate on acid/base balance, bone metabolism and cardiovascular risk factors in postmenopausal women.

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BACKGROUND:

A number of health benefits including improvements in acid/base balance, bone metabolism, and cardiovascular risk factors have been attributed to the intake of magnesium rich alkaline mineral water. This study was designed to investigate the effects of the regular consumption of magnesium bicarbonate supplemented spring water on pH, biochemical parameters of bone metabolism, lipid profile and blood pressure in postmenopausal women.

FINDINGS:

In this double-blind, placebo-controlled, parallel-group, study, 67 postmenopausal women were randomised to receive between 1500 mL and 1800 mL daily of magnesium bicarbonate supplemented spring water (650 mg/L bicarbonate, 120 mg/L magnesium, pH 8.3-8.5) (supplemented water group) or spring water without supplements (control water group) over 84 days. Over this period biomarkers of bone turnover (serum parathyroid hormone (PTH), 1,25-dihydroxyvitamin D, osteocalcin, urinary telopeptides and hydroxyproline), serum lipids (total cholesterol, HDL-cholesterol, LDL-cholesterol and triglycerides), venous and urinary pH were measured together with measurements of standard biochemistry, haematology and urine examinations. Serum magnesium concentrations and urinary pH in subjects consuming the magnesium bicarbonate supplemented water increased significantly at Day 84 compared to subjects consuming the spring water control (magnesium - $p = 0.03$; pH - $p = 0.018$). The consumption of spring water led to a trend for an increase in parathyroid hormone (PTH) concentrations while the PTH concentrations remained stable with the intake of the supplemented spring water. However there were no significant effects of magnesium bicarbonate supplementation in changes to biomarkers of bone mineral metabolism (n-telopeptides, hydroxyproline, osteocalcin and 1,25-dihydroxyvitamin D) or serum lipids or blood pressure in postmenopausal women from Day 0 to Day 84.