J Nutr. 2004 May;134(5):1058-63.

A sodium-rich carbonated mineral water reduces cardiovascular risk in postmenopausal women.

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This study was designed to investigate the possible beneficial effects of consuming a sodium-rich carbonated mineral water on lipoprotein metabolism and to determine whether consumption of this water influences endothelial dysfunction (ED) in postmenopausal women. Women included in the study were amenorrheic (>1 y), healthy, and not obese (BMI < 30 kg/m(2)). The subjects did not take estrogen replacement therapy; supplements of vitamins, minerals, and phytoestrogens; or other medications known to affect bone and lipid metabolism. The study consisted of 2 intervention periods of 2 mo each, during which women drank 1 L/d of a control mineral water (low mineral content) for 2 mo followed by the carbonated mineral water, rich in sodium, bicarbonate, and chloride, for 2 mo. Body weight, height, and blood pressure were measured, and BMI was calculated. Blood samples were taken from fasting subjects and serum was analyzed for total cholesterol, HDL-cholesterol, LDL-cholesterol, triacylglycerols, apolipoprotein AI, apolipoprotein B, soluble intercellular cell adhesion molecule-1 (sICAM-1), soluble vascular cell adhesion molecule-1 (sVCAM-1), and glucose. Blood pressure levels did not change throughout the study. Carbonated water intake decreased total cholesterol and LDL-cholesterol levels by 6.8% (P = 0.001) and 14.8% (P < 0.0001), respectively, whereas HDL-cholesterol concentration increased by 8.7% (P = 0.018), compared to the control period. Therefore, cardiovascular disease (CVD) risk indexes (total cholesterol/HDL-cholesterol and LDL-cholesterol/HDL-cholesterol) were markedly reduced (both P < 0.0001). Soluble ICAM-1 and sVCAM-1 levels decreased by 8.4% (P = 0.007) and 14.8% (P = 0.015), respectively. Fasting serum glucose concentration decreased by 6.7% (P < 0.0001). Triacylglycerol levels did not change. Consumption of this sodium rich carbonated water can play a beneficial role in the prevention of CVD and the metabolic syndrome.

PMID: 15113945 [PubMed - indexed for MEDLINE]

Br J Nutr. 2005 Mar;93(3):339-44.

Bone remodelling is not affected by consumption of a sodium-rich carbonated mineral water in healthy postmenopausal women.

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This study was designed to investigate the possible effects of consuming Na-rich carbonated mineral water on bone remodelling and urinary mineral excretion in postmenopausal women. Women (n 18) included were amenorrhoeic (>1 year), healthy and not obese (BMI <30 kg/m2). No woman was taking oestrogen replacement therapy, mineral and vitamin supplements, phyto-oestrogens or medications known to affect bone and lipid metabolism. In two consecutive interventions that lasted 8 weeks each, women drank 1 litre of control mineral water daily and 1 litre of carbonated mineral water, rich in Na, HCO3- and Cl-, daily. Body weight and height were measured, BMI was calculated and blood pressure was measured. Blood samples were taken from fasting subjects and serum obtained to analyse the biochemical bone markers, procollagen I amino-terminal propeptide (PINP) and beta-carboxy-terminal telopeptide of collagen (beta-CTX). At the end of each period, 24 h urine samples were collected to determine Ca, Mg, P, Na+, K+, Cl-, urine excretion and urinary pH. No changes in body weight, BMI or blood pressure were observed during the experimental period. Ca excretion was lower after the intake of carbonated water than after intake of the control water (P=0.037) while P excretion was higher (P=0.015). Total urine, Na and Cl- excretion did not differ between the two periods but urinary pH was increased after the intake of carbonated mineral water. PINP and beta-CTX did not differ between the two periods. Daily consumption of 1 litre of Na-rich carbonated mineral water for 8 weeks does not affect bone remodelling in healthy postmenopausal women.

PMID: 15877873 [PubMed - indexed for MEDLINE]

Br J Nutr. 2005 Oct;94(4):582-7.

Sodium bicarbonated mineral water decreases postprandial lipaemia in postmenopausal women compared to a low mineral water.

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The role of bicarbonated mineral waters on lipid metabolism and lipoprotein concentrations in man has scarcely been investigated. The present study aimed to investigate whether drinking sodium bicarbonated mineral water affects postprandial cholesterol and triacylglycerol metabolism in postmenopausal women. In a three-way, randomised, crossover study, eighteen healthy postmenopausal women consumed two sodium bicarbonated mineral waters (bicarbonated mineral water 1 and bicarbonated mineral water 2) and a low mineral water (500 ml of each) with a standard fat-rich meal (4552 kJ; 75.3 g fat). The bicarbonated waters were rich in sodium and bicarbonate and bicarbonated mineral water 1 contained 5.7 times more fluoride than bicarbonated mineral water 2. Fasting blood samples and postprandial blood samples were taken at 30, 60, 120, 240, 360 and 420 min after the end of the meal consumption. Cholesterol and triacylglycerols were determined in serum and chylomicrons. A significant water consumption effect was observed in the total area under the curve (TAUC) of serum and chylomicron triacylglycerols (ANOVA, P=0.008 and P=0.027, respectively). TAUC of serum triacylglycerols for bicarbonated mineral water 2 was significantly lower compared to low mineral water (Bonferroni, P=0.039). Peak concentration of serum triacylglycerols showed a significant water effect (P=0.025). Changes in chylomicron cholesterol were not significantly affected by the type of water. Bicarbonated mineral waters 1 and 2 did not show any significant differences. Drinking sodium bicarbonate-rich mineral waters reduces postprandial lipaemia in healthy postmenopausal women compared to drinking a low mineral water.

PMID: 16197584 [PubMed - indexed for MEDLINE]

J Nutr Biochem. 2003 Sep;14(9):492-506.

Dietary minerals and modification of cardiovascular risk factors.

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High serum cholesterol, hypertension and obesity are major risk factors for cardiovascular diseases, and together with insulin resistance form a deadly disorder referred to as the metabolic syndrome. All the aspects of this syndrome are strongly related to dietary and lifestyle factors; therefore, it would be reasonable to look for dietary approaches to their modification. Mineral nutrients, such as calcium, potassium and magnesium, lower blood pressure, and especially calcium has beneficial effects also on serum lipids. Recent evidence suggests that increased intake of calcium may help in weight control as well. This review summarizes previous literature on the effects and use of dietary minerals on serum lipids, blood pressure and obesity, with specific focus on the effects of calcium. Calcium and magnesium as divalent cations can form insoluble soaps with fatty acids in the intestine and thus prevent the absorption of part of the dietary fat. Decreased absorption of saturated fat leads to reduction in serum cholesterol level via decreased production of VLDL and increased intake of LDL in the liver. Dietary calcium may also bind bile acids, which increases the conversion of cholesterol to bile acids in the liver. Furthermore, calcium appears to enhance the cholesterol-lowering effect of plant sterols. Thus, dietary combination of the mineral nutrients and plant sterols provides a promising novel approach to the modification of cardiovascular risk factors.

PMID: 14505811 [PubMed - indexed for MEDLINE]