

## Evaluation of ionized calcium as a nutrient

Chen H, Kimura M, Zhu Z, Itokawa Y, The 11th symposium on Trace Nutrients Research, Japan Trace Nutrients Research Society, p131-138, 1994.

### Summary:

To clarify effect of ionized calcium water for drinking water in rats, 36 Male Wister rats weighing about 50g were randomly divided into 6 groups, and given following diet and drinking water :

- (1) Ca-sufficient diet, tapwater;
- (2) Ca-sufficient diet, tap-water;
- (3) Ca-sufficient diet, calcium lactate added-ionized calcium-water :
- (4) Ca-deficient diet, calcium lactate added-water ;
- (5) Ca deficient diet, calcium lactate added-water :
- (6) Ca-deficient diet, calcium lactate added ionized calcium-water.

The diets were given by paired-feeding method 4 weeks and drinking water was ad libitum. The significant change of calcium concentration in the rats were as follows; Ca concentration of plasma, spleen, of plasma, spleen, kidney, testis and tibia in Ca deficient groups (4), (5), (6) were significantly low compared with these in Ca sufficient groups (1),(2),(3) Ca concentration in brain of groups (4),(5),(6) was low compared to these in groups (2), Ca concentration in heart and muscle of group (4) was low compared to Ca deficient groups (1),(2),(3), but these in group (5) drank Ca added-water was recovered and these in group (6) drank ionized-Ca-water was higher than these in any other groups. Ca concentration of liver in groups (4) were significantly lower than that in group (1),(3) and Ca concentration of liver in Ca deficient rats (groups (5),(6) drank Ca-added-water were high compared to these in group (4). In 24 hours urine discharge of group (2) was high compared with groups (4), (5), (6). These results suggest that ionized Ca in drinking water may be active for intestinal absorption. Calcium and magnesium in drinking water and risk of death from cerebrovascular disease.

### MEDLINE ABSTRACT

Author: Yang CY Author Affiliation: School of Public Health, Kaohsiung Medical College, Taiwan, Republic of China. chunyh\*cc.kmc.edu.tw Source: Stroke 1998 Feb; 29(2):411-4

### BACKGROUND AND PURPOSE:

Many studies have demonstrated a negative association between mortality from cardiovascular or cerebrovascular diseases and water hardness. This report examines whether calcium and magnesium in drinking water are protective against cerebrovascular disease. METHODS: All eligible cerebrovascular deaths (17133 cases) of Taiwan residents from 1989 through 1993 were compared with deaths from other causes (17133 controls), and the levels of calcium and magnesium in drinking water of these residents were determined. Data on calcium and magnesium levels in drinking water throughout Taiwan were obtained from the Taiwan Water Supply Corporation. The control group consisted of people who died from other causes, and the controls were pair matched to the cases by sex, year of birth, and year of death.

### RESULTS:

The adjusted odds ratios (95% confidence interval) were 0.75 (0.65 to 0.85) for the group with water magnesium levels between 7.4 and 13.4 mg/L and 0.60 (0.52 to 0.70) for the group with magnesium levels of 13.5 mg/L or more. After adjustment for magnesium levels in drinking water, there was no difference between the groups with different levels of calcium.

### CONCLUSIONS:

The results of the present study show that there is a significant protective effect of magnesium intake from drinking water on the risk of cerebrovascular disease. This is an important finding for the Taiwan water industry and human health.