

Excerpts from World Health Organization, 2004, Geneva presented paper. Health Risks From Drinking De-mineralized Water, By F. Kozisek

Artificially-produced waters

Artificially-produced de-mineralized waters, distilled water and de-ionized or reverse osmosis-treated water, had been used mainly for industrial uses. These technologies became more extensively applied in drinking water treatment in the 1960's (as did salt softening methods for removing minerals).

Deminerlization of water was needed where the primary or the only abundant water source available was highly mineralized, brackish water, or sea water.

De-mineralized water is defined as water almost or completely free of dissolved minerals as a result of distillation, deionization, membrane filtration (reverse osmosis or nanofiltration), electro dialysis or other technology.

During the research...It was clear from the very beginning that desalinated or de-mineralized water without further enrichment with some minerals might not be fully appropriate for consumption.

There were three evident reasons for this:

- The potential for adverse health effects from long term consumption of de-mineralized water is of interest not only in countries lacking adequate fresh water but also in countries where some types of home water treatment systems are widely used or where some types of bottled water are consumed.
- Many brands of bottled water are produced by de-mineralizing fresh water and then possibly adding minerals for desirable taste.

Desalinated water, individuals drinking reverse osmosis-treated de-mineralized water, infants given beverages prepared with such water:

- Direct effects on the intestinal mucous membrane, metabolism and mineral homeostasis or other body functions.
- Low intake of other essential elements and microelements.
- Loss of calcium, magnesium and other essential elements in prepared food.
- Possible increased dietary intake of toxic metals leached from water pipes.

Dilution of electrolytes

Ingestion of distilled water leads to the dilution of the electrolytes dissolved in the body water. Inadequate body water redistribution between compartments may compromise the function of vital organs. Symptoms of this condition include tiredness, weakness and headache; more severe symptoms are muscular cramps and impaired heart rate.

Calcium and Magnesium

Calcium and magnesium are both essential elements. Calcium is a substantial component of bones and teeth. In addition, it plays a role in neuromuscular excitability i.e., decrease the proper function of the conducting myocardial system, heart and muscle contractility, intracellular information transmission and the coagulability of blood. Magnesium plays an important role as a cofactor and activator of more than 300 enzymatic reactions including glycolysis, ATP metabolism, transport of elements such as sodium, potassium, and calcium through membranes, synthesis of proteins and nucleic acids, neuromuscular excitability and muscle contraction.

Since the early 1960's, epidemiological studies in many countries all over the world have reported that soft water (i.e., water low in calcium and magnesium) and water low in magnesium is associated with increased morbidity and mortality from cardiovascular disease (CVD) compared to hard water and water high in magnesium.

Diet and Absorption from Water

The modern diet of many people may not be an adequate source of minerals and microelements. The elements are usually present in water as free ions and therefore, are more readily absorbed from water compared to food where they are mostly bound to other substances.

Medical Risk Studies

Low-mineral drinking water may be a risk factor for hypertension and coronary heart disease, gastric and duodenal ulcers, chronic gastritis, goitre, pregnancy complications and several complications in newborns and infants, including jaundice, anemia, fractures and growth disorders. The study focused on morbidity and physical development in 7658 adults, 562 children and 1582 pregnant women and their newborns in two areas supplied with water different in total dissolved solids (TDS).

Risks of De-mineralized Water in Food Preparation

When used for cooking, soft water was found to cause substantial losses of all essential elements from food (vegetables, meat, cereals). Such losses may reach up to 60 % for magnesium and calcium or even more for some other microelements. In contrast, when hard water is used for cooking, the loss of these elements is much lower, and in some cases, an even higher calcium content was reported in food as a result of cooking.

Since most nutrients are ingested with food, the use of low-mineral water for cooking and processing food may cause a marked deficiency in total intake of some essential elements that was much higher than expected with the use of such water for drinking only. The current diet of many persons usually does not provide all necessary elements in sufficient quantities, and therefore, any factor that results in the loss of essential elements and nutrients during the processing and preparation of food could be detrimental for them.

Increased risk from toxic metals

Low-mineralized water is unstable and therefore, highly aggressive to materials with which it comes into contact. Such water more readily absorbs metals and some organic substances from pipes, coatings, storage tanks and containers, hose lines and fittings.

Leaching Metals Risk

Lead leached from brass fittings and lead soldered seams and used of low mineral drinking water that had intensified the leaching process.

Anti-Toxic Tendencies

Calcium and, to a lesser extent, magnesium in water and food are known to have antitoxic activity. They can help prevent the absorption of some toxic elements such as lead and cadmium from the intestine into the blood.

Populations supplied with low-mineral water may be at a higher risk in terms of adverse effects from exposure to toxic substances compared to populations supplied with water of average mineralization and hardness.

Desirable Mineral Content

The corrosive nature of de-mineralized water and potential health risks related to the distribution and consumption of low TDS water has led to recommendations of the minimum and optimum mineral content in drinking water and then, in some countries, to the establishment of obligatory values in the respective legislative or technical regulations for drinking water quality.

Mineral Leaching from Body

Salts (and other minerals) are leached from the body under the influence of drinking water with a low TDS. A number of health outcomes were investigated including: dynamics of body weight, basal and nitrogen metabolism, enzyme activity, water-salt homeostasis and its regulatory system, mineral content of body tissues and fluids, hematocrit, and ADH activity.

Additional Conclusions

Drinking water should contain certain essential minerals. If not adequately re-mineralized) where home treatment or central water treatment reduces the content of important minerals and low-mineral bottled water is consumed.

Sufficient evidence is now available to confirm the health risk from drinking water deficient in calcium or magnesium. Many studies show that higher water magnesium is related to decreased risks for *cardiovascular disease* and especially for sudden death from *cardiovascular disease*. In addition to an increased risk of sudden death, it has been suggested that intake of water low in magnesium may be associated with a higher risk of motor neuronal disease, pregnancy disorders (so-called preeclampsia, and sudden death in infants) and some types of cancer.

Recent studies suggest that the intake of soft water, i.e. water low in calcium, is associated with higher risk of fracture in children, certain neurodegenerative diseases, pre-term birth and low weight at birth and some types of cancer.

Based on these findings, research, and data...we suggest you consider using InjectaFLO with SCALE SOFT.

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