Drinking Distilled Water- Are the effects Positive or Negative? - An Opinion

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My Opinion

Introduction
The rule of 3’s states that humans can live 3 minutes without oxygen; 3 days without water; and 3 weeks without food. Because adequate hydration is so important to both quality and quantity of life, what we drink is important. The human body is 60-70% water requiring fluids continuously to maintain optimum health. Humans require approximately ½ ounce water for every pound body weight daily or to prevent compromised health. Twenty percent of our fluid needs come from food. What water we drink provides the remaining 80%. It is commonly observed that distilled water is the fluid-of-choice when only pure substance-free H2O-solutions are required, such as for flushing surgical wounds, a solvent for medications, for vaccines, or intravenous solutions. Why therefore do we use only distilled water for delicate refined research solutions, but for our own health we drink water from unknown origins including the tap and man-made bottled solutions? For 56 years, I drank largely tap water, but for the last 15-years I drank only distilled pure water. Drinking distilled pure water, in my opinion, is less toxic, absorbs rapidly, prevents dehydration, and supports optimum health better than tap water.

Tap Water Toxins
Tap water has been reported to deliver several harmful substances. Tap water in the USA has been shown to contain 19 "inorganic metals of concern"(1994 Safe Water Drinking Act), for which maximum contaminant levels have been set.(1) Most American tap water tested falls between the ranges of 350 parts per million to over 1000 parts per million total contaminants.(2) Ralph Nader reported that over 2,110 different contaminants have been detected in tap water. Some were lead, asbestos, trihalomethanes, nitrates, nitrites, calcium, magnesium, sodium, potassium, chlorine, fluoride, lithium, and sulphates (3,4). Tap water may also carry and incubate harmful microbes, resulting in infection. Microbial plate counts of seven tap water specimens (controls) ranged from 4.0 CFU/mL to 95.0 CFU/mL. Even using tap water alone or tap water with bleach fails to improve water quality in dental unit waterlines. The American Dental Association (ADA) standard for reduced microbial contamination of dental unit waterlines was met using Bio2000 and distilled water treated with Bio2000. These results were well below both the 500 CFU/mL standard for public drinking water (5). In other words tap water is good for drinking, but it still introduces microbes into our body’s internal system, where as distilled water reduces microbial contamination.(6,7) The less microbial contamination introduced by air, fluids, or foods, the less toxic load on an already-taxed immune system. How does tap water provide a breeding ground for bacteria? Bacteria prefer mineral-rich water for growth. The behavior of 12 strains of gram-negative bacteria was analyzed in media having a low content of nutrients. Sterile tap water, de-ionized water, aqua bidestillata and mineral salt solution were used in this analysis. Serratia marcescens, Pseudomonas aeruginosa, Enterobacter, Klebsiella and Citrobacter were the most frequently observed growths. Providencia, E. coli, Erwinia, Hafnia, and Alkaligenes reached maximal colony numbers of some 100000/ml survived in mineral salt solutions. When the salts were added stepwise both potassium phosphate and especially magnesium sulfite demonstrated a growth-promoting effect (8). This is not to suggest that organisms do not grow in distilled water, but in the absence of growth-promoting mineral compounds, they appear to grow less vigorously, if at all. Some agree with Herbst’s concerns regarding the pollution potential from tap water (9,10,11). He [Herbst] wrote about the toxic contaminates in tap water:

“Organic pollution is still the most important anthropogenic stress factor influencing the usability of ground and surface water as drinking water for cattle. Organic pollution is decomposed in several distinct heterotrophic processes that cause oxygen deficit, and finally end in the production of ammonia, hydrogen sulphide or methane. Even after the oxygen balance being restored higher nutrient concentrations (eutrophication) will remain. Eutrophication itself often leads to secondary pollution processes that adversely affect oxygen availability. Certain bluegreen bacteria growing under highly eutrophic conditions may generate toxins. Due to the concentrations of organic substances bacterial growth is forced, sometimes including faecal indicators and pathogenic species originating from the effluents of most of the communal
sewage treatment works. Another kind of man-made pollution concerns certain toxic substances. Disregarding the effects of accidental spills, the industrial production and use of pesticides in agriculture as well as other industrial chemicals or heavy metals may cause concentrations beyond acceptable limits. The use of surface water for cattle may become a problem for this reason. Accidental spills must be reckoned with as well, so the technical equipment for providing alternative sources of drinking water in emergencies must be available. Whereas the use of groundwater is normally not affected by toxic substance or pathogenic bacteria, high concentrations of iron, humic acids or salination may affect the suitability of water for cattle. (12)

**Tap Water Minerals**

Do we need to drink tap water for our minerals? Tap water does indeed deliver a variety of minerals, which our body may have difficulty absorbing without the specific amino acids required for transition across intestinal walls. Minerals without amino acid carriers in drinking water are suspects mentioned in hardening of the arteries, arthritis, kidney stones, gallstones, glaucoma, cataracts, hearing loss, emphysema, diabetes, and obesity. What minerals are available in "hard" tap water, are poorly absorbed, or rejected by cellular levels, and, if not evacuated, their presence may contribute to arterial obstruction, or internal deposit (13,14). If (for example) the mineral content from tap water from Reno, Nevada were modified so that it would convert the daily Calcium requirement (RDA) from its calcium content, it would require drinking 7.4 gallons of tap water a day.

**Distilled Water Medium and Effects**

Distilled water (Unlike tap water) is microbe-free and is a superb medium for multiple forms of whole life growth, proliferation, and lifespan. How long simple life forms can live in a given solution is associated with the health-effects of that solution. Brine shrimp larvae are commonly used for cytotoxicity assays in pharmacology. These larvae are sensitive to toxic substances. The ratio between dead larvae (no motility) and living larvae (high motility) in comparison to a control without any toxic substances is used to estimate the toxicity of the test solutions. Brine shrimp larvae incubated in 1g in 4ml-distilled water at 37 degrees C for 48 hours to determine solution toxicity (15). Distilled water is therefore the best medium for whole life forms growth and proliferation rate. Distilled water reduces the toxic impact on the human immune system. Researchers also presented data to identify a previously unrecognized role for water quality on the severity of neuropathology induced by elevated cholesterol levels:

"Agent(s) occurring in tap water, excluded by distillation, promoting accumulation of neuronal Abeta immunoreactivity is (are) yet undisclosed, but arsenic, manganese, aluminum, zinc, mercury, iron and nitrate have tentatively been excluded because they were not identifiable (below detection limits) in the tap water of the three locales where the cholesterol-induced neuropathologic difference was observable. Neuronal accumulation of Abeta induced by increased circulating concentrations of cholesterol in the New Zealand white rabbit is attenuated when distilled drinking water is administered compared to use of tap water. The numbers of neurons in cholesterol-fed rabbits that exhibited Abeta immunoreactivity, relative to normal chow-fed controls, increased approximately 2.5 fold among animals on tap water but only approximately 1.9 fold among animals on distilled water. This yielded a statistically significant approximately 28% reduction due to the use of distilled water. These findings suggest that water quality may impact on human health in the setting of increased circulating cholesterol levels, and could illustrate a truly simple life-style change that could be of benefit in Alzheimers Disease." (16)

**Distilled water is rapidly absorbed and has been proven effective for preventing exercise-induced dehydration:**

Five trained men were studied during 2 hours of cycling exercise at 67% peak oxygen uptake at 20-22 degrees C to examine the effect of fluid ingestion on muscle metabolism. On one occasion, the subjects completed this exercise without fluid ingestion (NF) while on the other they ingested a volume of distilled deionized water that prevented loss of body mass (FR). No differences in oxygen uptake during exercise were observed between the two trials. Heart rate was lower throughout exercise when distilled deionized fluid was ingested, and rectal temperature after 2 h of exercise was lower (38.0 and 38.6 degrees C for FR and NF, respectively, as was muscle (vastus lateralis) temperature (38.5 and 39.1 degrees C for FR and NF, respectively. Resting muscle ATP, creatine phosphate, creatine, glycogen, and lactate levels were similar in the two trials, as were the postexercise ATP, creatine phosphate, and creatine levels. In contrast, muscle glycogen was higher and muscle lactate was lower after 2 hours exercise in distilled water hydration that prevented loss of body mass compared with exercise without fluid intake. Net muscle glycogen utilization during exercise was reduced by 16% when fluid was ingested (318 and 380 mmol/kg dry weight for FR and NF, respectively. These results indicate that fluid ingestion reduces muscle glycogen use during prolonged exercise, which may account, in part, for the
improved performance previously observed with fluid ingestion. (17)

Conclusion

Distilled water is clean, microbe-free, and mineral-free and is rapidly absorbed even during exercise-induced fluid loss. Tap water is not always clean, seldom microbe-free, contains minerals without their amino acid carriers for rapid absorption. Science chooses distilled water for refined, research protocols where substance-free pure-H2O is required. Perhaps humans should do likewise.

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