

1. Översiktsartikel av prof Schrauzer där han sammanfattar det rådande kunskapsläget 2002 gällande litium i dricksvatten

Lithium: Occurrence, Dietary Intakes, Nutritional Essentiality

Gerhard N. Schrauzer, PhD, CNS, FACN, Department of Chemistry and Biochemistry, University of California, San Diego.

Journal of the American College of Nutrition, Vol. 21, No. 1, 14–21 (2002)

Lithium is found in variable amounts in foods; primary food sources are grains and vegetables; in some areas, the drinking water also provides significant amounts of the element. Human dietary lithium intakes depend on location and the type of foods consumed and varies over a wide range. Traces of lithium were detected in human organs and fetal tissues already in the late 19th century, leading to early suggestions as to possible specific functions in the organism. However, it took another century until evidence for the essentiality of lithium became available. In studies conducted from the 1970s to the 1990s, rats and goats maintained on low-lithium rations were shown to exhibit higher mortalities as well as reproductive and behavioral abnormalities. In humans defined lithium deficiency diseases have not been characterized, but low lithium intakes from water supplies were associated with increased rates of suicides, homicides and the arrest rates for drug use and other crimes. Lithium appears to play an especially important role during the early fetal development as evidenced by the high lithium contents of the embryo during the early gestational period. The biochemical mechanisms of action of lithium appear to be multifactorial and are intercorrelated with the functions of several enzymes, hormones and vitamins, as well as with growth and transforming factors. The available experimental evidence now appears to be sufficient to accept lithium as essential; a provisional RDA for a 70 kg adult of 1000 micg/day is suggested.

Key teaching points:

- Lithium is normally present in all organs and tissues. Lithium is absorbed from the intestinal tract and is excreted primarily by the kidneys. Absorbed lithium is uniformly distributed in body water, with only a small difference between the extracellular and intracellular levels.
- During embryonic development, organ lithium levels reach maximal values in the first trimester of gestation and subsequently decline. Animal studies have demonstrated that Li plays a role in the expansion of the pluripotential stem cell pool to more mature progenitor cells and blood elements.
- In Li deficient rats, behavioral abnormalities and a significant negative effect on litter size and litter weight at birth were observed. In Li deficient goats the conception rate was reduced, gravid lithium deficient goats experienced a higher incidence of spontaneous abortions.
- Defined human lithium deficiency diseases have not been observed. However, inverse associations of tap water lithium contents in areas of Texas with the rates of mental hospital admissions, suicides, homicides and certain other crimes suggest that low lithium intakes cause behavioral defects.
- The average daily Li intake of an American 70 kg adult ranges from 650 to 3100 micg. Major dietary sources are vegetables and, in some areas, the drinking water.
- Subjects at risk of developing lithium deficiency are patients with kidney diseases and dialysis patients.