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Lithium Intake and Plasma Lithium concentrations of Healthy People:
Effect of the lithium as impurity of chemicals used for blood analysis

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Abstract:
Lithium carbonate is known as medical supplies for the remedy or prevention of manic-depressive psychosis. Blood lithium concentrations of their patients generally should be monitored during their hospital-treatments not to beyond the toxic concentration level of lithium. When heparin is usually added to a blood sample for preventing the blood-coagulation, impurity lithium of the reagent gives a positive error for the determination of lithium concentration of the blood. In this work the lithium concentration was determined by flame photometry after the decomposition of a sample with nitric-perchloric acids or hydrofluoric-nitric-perchloric acids for food samples. In the chemicals used for anticoagulant it was found that sodium citrate, heparin sodium salt and EDTA-2Na contained high amounts of lithium as impurity; 422, 221and 204 ng/g, respectively, whereas lithium was not detected in EDTA-4H and citric acid. Impurity lithium content of chemicals of general salt of sodium, potassium, magnesium and calcium were also tested; there was a fact that considerable amounts of lithium, 39500 and 14000 ng/g, existed in high purity of calcium metal and its carbonate. The Li/Ca ratio of the content of calcium salt (chemicals, n=36) was almost constant, and there was a good correlation between lithium and calcium content. The same tendency of the constant ratio of Li/Ca for the chemicals was also found in natural carbonate minerals of calcite, dolomite and aragonite, and biological materials of human milk, human serum, mammalian bone and oyster shell. On the other hand, lithium concentrations of plasma of healthy Japanese and Korean female were investigated, and the relationship between plasma lithium concentration and daily dietary lithium intake of the healthy people at urban district and village near seashore were also investigated in Korea. There was no significant difference between dietary lithium intake and plasma lithium concentration for the healthy people. Plasma lithium concentration was almost constant to be 11±2 ng/g (n=164) for healthy people.

Key words: Plasma lithium concentration, lithium intake, lithium as impurity of chemicals

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