Works are now in progress in further attempts to study ^{40}K contents in patients with various neuromuscular diseases and their non-dystrophic relatives; parents and siblings of patients, probable gen carriers, and definite gen carriers with or without abnormal seum enzyme levels.

Clinical Studies on ^{22}Na Metabolism with the Use of Whole Body Counters

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With the use of a whole body counter which is composed of plastic scintillators, a long-term study on sodimm metabolism was done in human subjects after a single ingestion of 10 μc of ^{22}Na.

Before the long term study, a tracer dose of ^{24}Na was administered orally to three normal subjects to establish the distribution of radioactive sodium in the body. The profile scanning was repeated until an equilibration of ^{24}Na in the bodies was found, using another type of whole body counter with $8''\times4''$ NaI crystal.

Three normal females and 10 patients with hypertension, with and without chronic nephritis, carcinoma of uterus and subacute thyroiditis were studied. During the course of the study, they took a diet containing ten grams of NaCl per day. In some case, 25-30g of NaCl or 50-75mg of hydrochlorothiazide per day were given orally, after a period of a week of the normal diet.

Ten μc of $^{22}NaCl$ diluted with distillated water was administered orally to the subject in the fasting state. The total body counting was carried out 5 minutes, 2 hours after the ingestion of ^{22}Na, and then at an interval of 24 hours for a period of 2 months or more.

The concentration of stable Na and ^{22}Na in the serum were measured by a flame photometer and by a coincidence type low background β-spectrometer respectively. The ^{22}Na in the urine was determined by a well type scintillation counter.

The results are summarized as follows:

(1) The use of whole body counters for the study of a long-term sodium metabolism was superior to the usual balance techniques. It was difficult to estimate the extrarenal excretion of ^{22}Na by the latter method.

(2) The distribution of ^{24}Na in normal subjects was found to be equilibrated between 1 to 2 hours after a single ingestion of ^{24}Na.

(3) In 4 normal female subjects, the biological half life (B.H.L.) of ^{22}Na was approximately 12 days and the exchangeable sodium (Na_e) was 2100 meq in average under the condition of a daily intake of NaCl in a dosis of 10g.

(4) In the patients with hypertention, a tendency was found that the B.H.L. was prolonged.

(5) In the patients with hypertension, the B.H.L. of ^{22}Na decreased after the administration of hydrochlorothiazide. The effect of the drug on the B.H.L. was most significant within a few days, and then diminished gradually, even when the same dose of the drug was continued. Stopping the administration of the drug, the B.H.L. of ^{22}Na became slower than that of the initial stage of the experiment.

(6) The high intake of NaCl resulted in a decreased B.H.L. and an increaded Na_e.

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