in all three groups were statistically significant. The mean T½ in the patient with Wilson's disease was 97.0 days. The mean for carriers was 39.6 days. The mean for normal subjects was 17.1 days. These were also statistically significant. We believe that the study of the body retention of radioactive copper will make it possible to distinguish easily between heterozygous carriers and homozygous normal individuals and may be useful as a screening test. This would likely be a screening method sufficiently simple that it could be applied to large numbers of subjects.

Clinical Application of Whole Body Counting

H. Saito

Radioisotope Laboratory, Nagoya University School of Medicine, Nagoya

Althouth calcium kinetics gives bone formation rate (BFR), bone resorption rate (BRR) and misciple pool size, these are not always sufficient information for the calcium metabolism. Whole body counting adds further important information of diagnostic value.

Calcium kinetics data of four normal subjects in average were BFR=8.1, BRR=8.1, miscible calcium pool size=75.4 mg/kg. Whole body retention of Ca-47 of a normal subject gave a half value T½=25 days, and 67% of total loss was found in feces, and 33% in urine. In patient with hyperthyroidism having BFR=54, BRR=64, miscible pool size=90.6, loss in urine within 24 hours reached to 10%, and T½ was 21 days thereafter. In postmenopausal osteoporosis, having BFR=7.4, BRR=13.9, and miscible pool size=60.6, T½ was 13 days and 78% of whole body loss was found in urine. There found no initial large loss as observed in patient with hyperthyroidism. In patient with Cushing's syndrome, having BFR=4.5, BRR=12.3 and miscible pool size=58.3, whole body loss T½ was 8 days and 94% of total loss was found in urine. In this case, the difference between BFR and BRR was too small to suggest such a large amount of whole body loss. In patient with pseudohypoparathyroidism, having BFR=29.0, BRR=44.2, and miscible pool size=169, whole body loss T½ was 56 days, and loss in feces was larger than in urine. Before the information of whole body counting was obtained, this patient was supposed to have secondary hyperparathyroidism from large BFR and BRR value and the difference between them. However it was ruled out by the smallest whole body loss rate. In this patient, 62% of total loss was found in feces and 48% in urine.

From these observation, it is obvious that the loss in urine played an important role for the large amount of whole body loss. Total amount of whole body loss was recovered in total excreta of urine and feces. Furtheremore, the general trend that the larger the miscible calcium pol size, the smaller the whole body calcium loss.

The quantitative body section counting with our Ring-type total body counter which scans patient from head to foot with 6 detectors around the body showed the completion of distribution of Ca-47 after 4 hours in proportion to the distribution of bone, and there found no significant change in the distribution pattern after 24 hours.

The difference of BRR minus BFR divided by the average of BRR plus BFR would imply the ratio of negative balance in general calcium metabolism, and the ratio seems to correlate to whole body loss rate in % per day.

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