Analysis of Calcium Metabolism in Humans

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(1) Long-term mesearments of whole body counts were made on four subjects for 68 to 617 days after intravenous administration of strontium-85

(2) The whole body retention curve were adequately fitted to the sum of three exponential functions as well as the gamma function, but it was unable to express them in terms of the power function.

(3) The parameters of calcium metabolism were derived from the gamma function as follows.

Gamma function

$$Rwb(t)=E^{n}(E+t)^{-n}\exp(-at)$$

$$Ke(\text{excretion rate coefficient})=\frac{n}{E}+a\left(\frac{E+t}{E}\right)$$

$$Ka(\text{accretion rate coefficient})=\frac{1}{E}$$

$$Kr(\text{resorption rate coefficient})=a+\frac{n+1}{E+t}$$

An Experimental Study of the Distribution of Radioiodide Labeled Chinoform

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Today SMON (subacute myelo-optico-neuropathy) seems to be associated with usage of chinoform epidemiologically and experimentally. The purpose of this paper was to study the distribution of radioiodide labeled chinoform in animals.

Albino rabbits weighing about 1 kg were used in this study as experimental animals. The animals were kept in metabolism cages with double screen floors which allowed to collect urine and feces separately. 3 rabbits were given this drug orally in capsule. 2 rabbits were injected intravenously and other 2 were given orally same dose of the drug in Tween 80 emulsion.

Excretion rate of radioactivity in the urine and feces was measured. 300 μCi of ^{131}I labeled chinoform was administered. The animals were sacrificed at 1, 2, 4, 7, 24, 48, 72 and 96 hours after the administration and the radioactivity in the organs (kidney, liver, spleen, thyroid gland, sciatic nerve, cerebrum etc.) was measured.

Results:

1. In the animals which the radioiodide labeled chinoform in capsules were given orally, 44 to 66 per cent of the total radio-activity was detected in the urine and 26 to 51 per cent in the feces within 72 hours.

2. In the animals which the radioiodide labeled chinoform in Tween 80 emulsion was given orally, 46 to 68 per cent of the total radioactivity was detected in the urine and 14 to 22 per cent in the feces within 72 hours.

3. In the animals which the radioiodide chinoform in Tween 80 emulsion was given

intravenously, 82 to 96 per cent of the total radioactivity was detected in the urine and 1.4 to 2.2 per cent in the feces within 48 hours.

4. High concentration of the radioactivity was detected in the kidney, thyroid gland, bile juice, liver, spleen, sciatic nerve. And most concentrated radioactivity was found in sciatic nerve and brachial nerve at 7 hours after the administration.

Late Effects of Single X-Ray Exposure on the Pathway of Glucose in Rat (Report I. Brain)

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The present data give remarkable decrease of aerobic glycolysis activity in the rat, in which the head was exposed by a large single dose of 5,000-10,000R. A major biochemical activities in both central nervous system and pituitary gland might be decreased by the exposure, so that the remarkable reduction of glycolysis was resulted in several organs being controlled by them. This may be one of the main reasons to let the rat die. After intraperitoneal injection of the solution of ^{14}C-U-glucose (4 μCi/rat), the male adult rats exposed to a given X-ray dose were placed in a continuous air flow system combined with a radio-gas liquid-chromatograph for continuous counting and recording of the expiratory $^{14}CO_2$ during an experimental period of 3 hrs. Obtained $^{14}CO_2$-yields gave no particular difference between exposed and non-exposed rats. In such experiment, it is noticed that the yields must be dependent on not only the glucose amount in the blood and other organs but the glycogen amount in the liver. There was no change in glucose concentration, hematocrit and red blood cell count in blood with the X-ray exposure of 1,000R, 5,000R and 10,000R. Contrary to this, After 5,000R and 10,000R exposures, a distingwished decrease was observed in liver, kidney and spleen weights, and efficient blood flow.

Slight decrease in the blood flow rate was also observed. The histochemical study gave a lack of glycogen in the liver. This might provide higher utilization of ^{14}C-glucose in the exposed than that of the control rats. Therefore, the actual yields of CO_2 from glucose must be reduced to about 1/2-1/5 times than that of the control, assuming that 1/3 of ^{14}C-glucose was contributed for CO_2-formation during a 3 hr.-period after the injection and remaining 2/3 were accumulated in the liver. These data support remarkable decrease of aerobic glycolysis in heavily exposed rate. When ^{131}I-RISA was injected intravenously, a huge amount of ^{131}I was released from RISA by deiodinating action of tissues other than the thyroid, and might be excreted directly from the rectal portion near the anus. This might be resulted from the reduction of thyroid activity controlled mainly by the pituitary gland.