^{32}P was made by well-type scintillation counter and of ^{3}H was by fluid scintillation counter.

The following results were obtained:

1. The radioactivities of ^{32}P in stomach were about 15% of oral dosis at 30 minutes, 10% at 60 minutes and very low at 120 minutes after the administration.

2. The radioactivities of ^{32}P in the upper half of small intestine were about 30% at 30 minutes, 20-25% at 60 minutes, 15% at 120 minutes and 10% at 180 minutes after administration, and these in the lower half were about 15% at 30 minutes, 15-20% at 60 minutes 15% at 120 minutes and 5-8% at 180 minutes. The radioactivity in caecum appeared at 120 minutes after administration and gradually increased.

3. The absorption rates of ^{32}P were about 40% at 30 minutes, 45-50% at 60 minutes, 50-60% at 120 minutes and 75-80% at 180 minutes after the administration. That of ^{3}H at 120 minutes was almost same as ^{32}P. ^{32}P and ^{3}H were more rapidly absorbed in the younger rats.

4. The radioactivities of ^{32}P in liver were about 15% at 120 minutes after the administration and gradually increased to 17-21% at 180 minutes. That of ^{3}H at 120 minutes was about 1/3 of ^{32}P in radioactivity. This difference between ^{32}P and ^{3}H seemed to show the phosphate linkage of active vitamin B_6 would be dissociated at least on entering into the liver.

5. Pyridoxine in portal blood at 120 minutes after the administration of ^{3}H-PINP almost active form.

These results suggest that a part of active vitamin B_6 might be probably absorbed from the rat intestine. This opinion, however, must be comfirmed by further experiments in future of course.

Turnover of Protein and Free Amino Acid of Serum and Tissues (Myocardium and Skeletal Muscle) in Dogs with Experimentally Produced Aortic Insufficiency

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The turnover rate of protein and free amino acid of myocardium and skeletal muscle was studied in the control dogs and in those with experimentally produced aortic insufficiency. In addition, a large dose of Vitamin B_{12} was given some of dogs with aortic insufficiency to study the effect of Vitamin B_{12} on the turnover of myocardial protein and free amino acid in the overloaded heart. Also, the turnover rate of serum protein and free amino acid, which may have an effect on the metabolism of myocardial protein, was studied.

Experiments were performed on 24 adult mongrel dogs of both sexs. The dogs were divided into three groups: (1) Control group, (2) AI group (dogs with experimentally produced aortic insufficiency), (3) AI+VB_{12} group (in this group, 500γ of Vitamin B_{12} were given by intramuscular injection daily after the operation during the experimental periods).

DL-leucine-1-C^{14} was used in all experimental dogs; 40 μCi/kg body weight of DL-leucine-1-C^{14} were injected intravenously. Blood samples were collected at 10, 30, 60, 120, 180 and 240 minutes and intervals of 4 days after injection of leucine-C^{14}. In order to obtain the myocardium and skeletal muscle, the dogs were sacrificed at 1st, 5th, 20th and 30th days after injection of leucin-C^{14}.

The extraction of protein and free amino acid of serum and muscle was performed by method of Shmidt-Tanhauser. The radioactivity of protein and free amino acid was determined, using a liquid scintillation counter, in a dioxan scintillator.

The radioactivity of left ventricular protein in AI and AI+VB_{12} groups declined more

rapidly than that of control group for the first five days, but there was no difference in disappearance of the radioactivity among three groups after 5th day. For the first five days, the biological half-life of muscle protein of left ventricle was 12.5 days for AI group and 6.5 days for AI+VB_{12} group. After 5th day it was the same value (23 days) in every group. The radioactivity of skeletal muscle protein in control group showed a maximum on the first day, but the maximum specific activity in AI and AI+VB_{12} groups occured between first and 5th day. After reaching the maximum values, disappearance of radioactivity was about the same in every group. The bilogical half-life of skeletal muscle protein was about 65 days. While radioactivity of free amino acid of myocardium and skeletal muscle already approached back ground levels at the first day after injection of leucine-C^{14}.

Disappearance of radioactivity from serum protein and free amino acid was about the same in every group. The biological half-life of serum protein was about 11 days and that of serum free amino acid was about 2 days.

From these results, it seems likely that the turnover rate of myocardial protein in the overloaded heart increases during acute overloaded periods (for the first gve days after the production of aortic insufficiency) and Vitamin B_{12} accelerates the turnover rate of protein in acute overloaded heart.

Use of $^{14}CO_2$ Measurement Method for the Clinical Study of the Metabolism of Labelled Compounds

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A new and simple equipment to collect expired $^{14}CO_2$ delivered from given ^{14}C labelled compounds was modified from that reported by Abt.

The expired air is exhaled through mask into a plastic bottle containing calcium chloride, which removes the moisture from the breath. Then the air is passed directly into a liquid scintillation counting vival which contains 1 ml of 1 molar hydroxi hyamine. The hyamine neutralizes 1m mole of carbon dioxide in the expired air. The end point of the neutralization is indicated by decolaration of phenolphathalein indicator. The time required for the sampling of breath to neutralize hyamine is about 2 minutes. The counting vial is then removed from the apparatus and is added 15 ml of scintillator. Then the ^{14}C activity is measured by liquid scintillation counter. Using this equipment $^{14}CO_2$ in expired air can be collected and measured in succession with a few minutes intervals.

This apparatus was applied for the study of intestinal absorption of lactose with the purose to diagnose milk intolerance.

Methods: Lactose-1-^{14}C 10μCi was given orally together with nonradioactive lactose 50 g. The $^{14}CO_2$ in the exhaled air was collected and measured at ½, 1, 2, 3, 4, 8, 12, and 24 hours. Blood sugar was measured at ½, 1, 2, 3 hours. The jejunal biopsy was performed and the intestinal lactase activity was measured by Dalqvist method.

Materials: Ten patients admitted in our department were studied. $^{14}CO_2$ in the breaths was measured in all cases. Blood sugar was measured in 9 cases and lactase actiity in 5 cases.

Results: The activity of expired $^{14}CO_2$ reached the highest level at 3 or 4 hours after the administration of lactose. So the curves of$^{14}CO_2$ activity from 0 to 3 or 4 hours were investigated.

Among 7 cases which revealed diarrhea during examination and/or gave low lactase activivty, 4 cases showed flat $^{14}CO_2$ curves (group A) and 3 showed normal $^{14}CO_2$ curve