Studies on the Metabolism of Acetone Bodies in Alloxan Diabetic Rabbits

Y. ASAGOE, S. NAKAMOTO and M. SHIMA

First Department of Internal Medicine, Tottori University School of Medicine

Previous studies from our laboratory revealed that acetone bodies eliminated into bile and the concentration of acetone bodies in bile is approximately 1.4 times higher than that in serum.

The present study was designed to clarify the fate of acetone bodies excreted into bile and the metabolism of acetone bodies with normal and alloxan diabetic rabbits.

1. Ethyl-acetoacetate-3-14C injected into the duodenum of both normal and alloxan diabetic bile fistula rabbits was absorbed from the intestine and excreted into bile. Most of 14C in biliary acetone bodies of both animals were rapidly excreted within first 6 hours. Thus the evidence of the enterohepatic circulation of 14C-Acetone bodies was demonstrated.

2. Acetate-1-14C was administered intravenously to normal and alloxan diabetic fistula rabbits. The total 14C recovered as 14C-Acetone bodies in bile was 2 times greater in alloxan diabetic than in normal 24 hours after injection. Blood and bile levels of acetone bodies and radioactive acetone bodies in diabetics were much greater than in normal. The specific activities in serum and bile of normal rabbit decreased rapidly in the first 6 hours, while those of diabetics decreased slowly over 24 hours. This result indicates that the conversion of 14C-Acetate to 14C-Acetone bodies will be delayed markedly in diabetics.

3. Radioactive acetone bodies were kept much greater in muscle than in other tissues of alloxan diabetics 24 hours after injection of 14C-Acetate. These findings indicate that acetone bodies are significantly accumulated in the muscle of alloxan diabetic rabbit.

Studies of Fatty Acid Metabolism with Incorporation of 14C into Lipids of Human Whole Blood and Bone Marrow (Report 1)

Normal Subjects and Patients with Aplastic Anemia

I. IWASAKI, M. KIBATA and S. ARIMORI

Department of Internal Medicine, Okayama University Medical School

Numerous studies of fatty acids metabolism with animals and plants. Awai and Hennes have described RI incorporation into lipids of human blood, particularly from normal Americans and patients with diabetes mellitus.

We have incubated whole blood and bone marrow from Japanese normal subjects and five patients with aplastic anemia one non-treated and four under treatment. We have followed the procedure of Awai and Adams; five ml. of whole blood and two ml. of bone marrow plus three ml. of his own blood plasma was obtained and five μc of 1-14C-Acetate sodium was added to it. After four hours of shaking incubation at 37°C, lipids were extracted according to the method of Folch et al. Saponification by Bjorntorp, and methyl esterification were performed in this order.

The methyl esters were then separated by gas liquid chromatography, using a 2250 mm. 20 percent diethyl glycol succinate column. The fatty acid methyl esters in each peak were trapped by the specially prepared defatted siliconized cotton plug and the radioactivity of each fatty acid was measured by the liquid scintillation spectrometer (Shimadzu L S G-3 type).

Wakil et al. had found that fatty acid