Metabolism of ^{131}I-Labeled Iodobenzoic Acid in Rats

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Hippuric acid is synthesized from benzoic acid in the liver. Behaviors of ^{131}I-labeled ortho-iodobenzoic acid (IBA) in body and excretion of IBA (or its metabolic products) in urine may be related to liver function. So we investigated metabolism of IBA in normal rats and liver injured rats. Female rats were divided into two groups. The one group was used for control, and the other group was injured in the liver by carbon tetrachloride. IBA (about 2μCi) was given intravenously and dose of IBA was 0.01mg, 0.1mg, 1 mg and 10mg per 100g body weight. These rats were sacrificed 30 minutes, 1 hour, 2 hours, 3 hours and 5 hours after injection of IBA. The activities of the liver, kiney, blood and urine were measured by Well-Type Scintillation Counter. Retention values (dpm/mg tissue weight) in the liver, kidney and blood were calculated and the urine was analyzed radiochemically. Excretion in the urine contained ^{131}I-labeled ortho-iodohippuric acid (IHA), ^{131}I-labeled ortho-iodobenzoyl-glucuronic acid (IBGA) and IBA. Amounts of IBA, IHA and IBGA were calculated as per cent of IBA administered dose. In the cases of IBA 0.01mg, 0.1mg injection, there were no significant differences in the retention values of three organs between control and the injured. In the cases of IBA 1mg, 10mg injection, there were recognizable differences in the retention valus of three organs between control and the injured. Excretion rate were expressed as per cent of administered does as follows: Excretion rate of IHA or IBGA or IBA (of dose)

$$= \frac{\text{IHA or IBGA or IBA excreted}(\mu\text{Ci})}{\text{IBA administered}(\mu\text{Ci})} \times 100$$

In the cases of IBA 0.01mg, 0.1mg and 1mg injection, the excretion rate of IBA and IHA were about 10% and 50% of administered dose, respectively, in the both groups of control and the injured, but the excretion rate of BGA was from 20% to 30% of administered dose in control group and about 15% in the injured. In the case of IBA 10mg injjection, the excretion rate of IBA and IHA were about 10% and 15% of administered dose, respectively in both groups, but the excretion rate of IBGA was about 40% in control and 33% in the injured, of administered dose. Namely, when IBA was injected intravenously as a single tracer dose of 0.01mg or 0.1mg, there was no significant difference in total excretion between control and the injured. In the cases of load dose of IBA 1mg, 10mg excretion was delayed in the injured. In the injured group, regardless of dose, producing capacity of IBGA decreased to delay in excretion of IBA. Generally, when a large dose of IBA was administered, synthesis of IBGA was extremely increased, as producing capacity of IHA was limited.