

BSP. In such study,  $^{131}\text{I}$ -BSP served as reference for the position of non-conjugate BSP. BSP was excreted in bile of Dubin-Johnson patients, but only non-conjugate form was present for the first one hour or so. In this syndrome, biliary excretion of conjugate BSP is impaired. In contrast, in Rotor syndrome, biliary excretion of both non-conjugate and conjugate forms of BSP was normal.

In experimental biliary obstruction, intravenously administered BSP appeared in plasma in conjugated forms. However in human obstructive jaundice, very little conjugate BSP was detected in plasma, yet urine contained considerable amounts of conjugate forms.  $^{131}\text{I}$ -BSP is a useful adjunct in the study of BSP metabolism and hence of liver cell metabolism in general.

### Studies on the Early Functional Disturbance of Irradiated Liver

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Many observations have been mainly based on histological experiments and have been indicative of vascular changes and intercellular hepatic edema by mild doses of liver irradiation. We reported early findings on scintigrams of the irradiated liver by  $^{131}\text{I}$ -Rose bengal or  $^{198}\text{Au}$  colloid, and another experiment were indicated that DNA synthetic rate of bone marrow decreased by liver irradiation (abscopal effect) and recovered by exogenous purines. Therefore the bone marrow cells may be supplied their necessary purine from the liver. Early functional damage may caused by irradiation. In this experiment, the liver function was observed by clearance of  $^{131}\text{I}$ -BSP on 100 R, 3000 R. and 5000 R. irradiated liver and blood volume of irradiated liver was observed by  $^{131}\text{I}$ -HSA.

**X-ray-irradiation:** The animal was shielded by 5 mm lead except the liver and 1000 R, 3000 R. or 5000 R. (190 KVp, 10 mA, 320R/Min) was irradiated.

**Isotopes:** 1)  $^{131}\text{I}$ -BSP (40  $\mu\text{Ci}$ ) was injected

intravenously to rabbits, the venous blood was obtained at 30 sec., 1. 3. 5. 10. 15. 20. 25. 30. and 45 min. after injection and was measured by well type scintillation counter. 2)  $^{131}\text{I}$ -HSA (6–12  $\mu\text{Ci}/0.1\text{ ml}$ ) was injected intravenously to mice. Those animals were sacrificed by throwing into acetone dry-ice ( $-70^\circ\text{C}$ ) at 30 sec. after injection, some parts of the liver and blood were obtained and were measured by well type scintillation counter.

**Results:** Blood volume of the irradiated liver increased at 30 min. after irradiation, slightly decreased at 1 to 3 days and recovered.  $^{131}\text{I}$ -BSP clearance was disturbed on each irradiation dose. The disturbance was found immediately after irradiation and recovered. The period of disturbance indicated by  $^{131}\text{I}$ -BSP clearance was similar to that of increasing in the blood volume. These may be suggested that the early capillary damage which was induced by liver irradiation is one of cause of early liver functional disturbance.