
Quantitative estimation of liver and spleen uptake was made in various hepato-biliary diseases using emission computed tomography (ECT) with the use of a 30 cm collimated camera. 

Ten min after administration of 3m Cl of Tc-99m-phytate, image data were collected 3 min. by continuous rotation mode. Following reconstruction, attenuation correction was made by Chang's method. Uptake images were constructed by displaying in color the quotient of the counts for each of the elements divided by the dose. Total liver or spleen uptake was calculated by the sum of the regional uptake over the organs.

In 6 adult normals, total liver uptake was 74.3±6.4% (mean±S.D.) and spleen/liver ratio (S/L ratio) was 6.9±1.7. Total uptake of liver and S/L ratio in liver cirrhosis was 33.5±7.5% and 29.8±23.5, providing useful information on liver function. In various types of biliary diseases, total liver and spleen uptake correlated well with liver blood flow (y=-0.694) and lipid emulsion test (y=-0.767), while, the correlation between total liver uptake and ICG Rmax was poor.

Although a regional mean liver uptake was correlated well with total liver uptake (y=0.903), slight discrepancy was found in some cases who had decreased liver volume with normal mean uptake.

ANALYSIS OF HEPATIC FLOW CURVE BY TC-99m-Sn COLLOID, USING THE RAPID INTRAVENOUS INJECTION OF COLLOID, WE ESTIMATE THE HEPATIC AND SPLENIC FLOW CURVES, BY WHICH THE DIFFERENTIAL DIAGNOSIS OF THE SEVERAL LIVER DISEASES IS PERFORMED. THERE ARE 75 CASES CONSISTED OF HEPATITIS, LIVER CIRRHOSIS, HEPATOMA, METASTATIC LIVER TUMOR, AND NORMAL 31 CASES AS A CONTROL. FOLLOWING AS SARPER'S METHOD, WE DETERMINED ARTERIALIZATION INDEX (AI). BY THE SAME WAY, THE SPLENIC INDEX (SI) IS DETERMINED FROM THE RATIO BETWEEN THE SLOPE OF ARTERIAL PHASE IN SPLENIC FLOW CURVE AND THAT OF ARTERIAL PHASE IN LIVER. AS AND SI ARE 0.65±0.19 AND 0.31±.18 IN NORMAL, 1.02±0.42 AND 0.34±0.23 IN HEPATITIS, 2.65±4.01 AND 0.82±0.29 IN LIVER CIRRHOSIS, 1.90±0.73 AND 0.51±0.19 IN HEPATOMA, 0.92±0.11 AND 0.30±0.15 IN METASTATIC LIVER TUMOR, RESPECTIVELY. AI AND SI OF LIVER CIRRHOSIS AND HEPATOMA ARE SIGNIFICANTLY HIGHER (P<0.05) TO THAT OF NORMAL CASES. IN OTHER LIVER DISEASES AI AND SI ARE INSIGNIFICANT TO THAT OF NORMAL. IN ROUTINE TREATMENT OF LIVER SCINTIGRAPHY, BY ADDING THE ABOVE MENTIONED METHOD, THE INCREASED INFORMATION OF CIRCULATION DYNAMICS IN LIVER SEEMS TO BE USEFUL FOR DIAGNOSIS OF THE LIVER DISEASES.