Studies on ^{99m}Tc-MIBA (Mercapto Iso Butyric Acid) ^{99m}Tc-DHTA (Dihydro Thioctic acid) As Hepato-Biliary Transport Agents

C. TOBARI

Dept. of Radiology, School of Medicine, Toho University

K. CHIBA, S. KAWAGUCHI, M. ABE, H. MURATA, K. MATSUI, H. YAMADA and M. IIO

Devision of Nuclear Medicine, Tokyo Metroporitan Geriatric Hospital

The purpose of this paper is to evaluate ^{99m}Tc-MIBA (Nihon Mediphysics) and ^{99m}Tc-DHTA as the agents for hepato-biliary transport study. The scintigrams were obtained until 48 hours after administration of 2–3 m Ci as ^{99m}Tc-MIBA in 13 patients and ^{99m}Tc-DHTA in 17 patients.

(Results)

1) The labelling yield by ^{99m}Tc were 80–90% in MIBA and 40.3–48.9% in DHTA which lasted several hours after preparation.
2) K values in the 1st phase of the blood clearance were 0.04–0.13 in MIBA and 0.024–0.04 in DHTA while K value of BSP was 0.099–0.193.
3) The urine excretion measured 24 hours after administration of each agent were 30–46% in MIBA and 6–14% in DHTA while that of BSP was 5%.
4) In order to compare the grade of hepato-biliary transport of each agent following grades were determined based on the time-course differences of the density between liver and intestine. The average scores of liver were 4 until 8 hours followed by 3 in 24 hours in MIBA, while the average scores of intestine were 1.5 in 6 hours and 2.5 in 24 hours in MIBA. The average scores of liver were 2.8 in 3 hours and 2 in 24 hours in DHTA, while that of intestine were 1.6 in 3 hours and 3 in 24 hours in DHTA. On the other hand the average scores of liver were 1.5 in 3 hours and 0 in 24 hours in BSP while that of intestine were 3.5 in 3 hours and 4 in 24 hours in BSP.
5) Visualization of heart were noted in 50% by MIBA and 7% by DHTA.
6) Visualization of kidney were observed in 16% by MIBA and 47% by DHTA.

In conclusion,

1) Binding capacity of DHTA was lower than that of MIBA.
2) Blood clearances of MIBA and DHTA showed lower values compared with that of BSP.
3) Urine excreation rate of MIBA was higher than those of DHTA and BSP.
4) Hepato-biliary transport of MIBA and DHTA were later than that of BSP.
5) Retention of MIBA and DHTA in the heart were longer than that of BSP.
6) Visualization rate of DHTA in the kidney was higher than that of MIBA. Clinically both agents were available for liver imaging, however, for the quantitative hepato-biliary study those two agents are still inferior to conventional ^{131}I-BSP.