Tc-99m DMSA PHARMACOKINETICS IN HUMAN BODY

The time course study indicated that Tumor Tissue ratio was Disappearance time of Tc-99m DMSA from the blood was Mt. After i.v. injection of Tc-99m DMSA, it was excreted into the urine without any change. There were no remarkable side effects by i.v. administration. The pharmacokinetics of Tc-99m IV dimercaptosuccinic acid (DMSA) in human body was studied using normal volunteers. A new tumor diagnosis radiopharmaceutical was excreted into the urine without any change.

A NEW TUMOR DIAGNOSIS RADIO-PHARMACEUTICAL

TERMA T D TODULE DIAGNOSIS RADIOPHARMACEUTICAL Tc-99m DMSA (III): CLINICAL STUDIES. K. Endo, H. Ohta, K. Yamamoto, M. Morita, K. Torizuka, School of Medicine, N. Hata, H. Masuda, A. Yokoyama. Faculty of Pharmaceutical Sciences, Kyoto University.

In order to evaluate the usefulness of Tc-99m dimercaptosuccinic acid (DMSA) as a tumor seeking agent, scintigraphic studies were performed in patients with various malignant tumors. Tc-99m DMSA, which was obtained at a labeling condition of a pH 8 and a very low concentration of SnCl₂, was injected intravenously and scintigraphy was taken at 2 or 3 hours after the administration using a conventional gamma camera. In some patients, the distribution was compared with Ga-67 citrate scintigraphy. [Results] Preliminary study showed the different characteristics of Tc-99m DMSA and Ga-67 citrate distribution in the tumor diagnosis. Tc-99m DMSA was superior in the head and neck tumor and soft tissue tumors. It is well known that previous radiation caused Ga-67 accumulation in the salivary glands. However, previous radiation did not affect Tc-99m DMSA distribution, indicating that Tc-99m DMSA would be useful for the follow the response to the treatment in the head & neck tumors. The preliminary study showed that Tc-99m DMSA would be a promising tumor seeking agent and useful in the detection of malignant tumors, to assess their sites and to follow the response to the treatment.

ALTERATION OF BIODISTRIBUTION OF Ga-67 CITRATE AND Tc-99m MDP IN RATS FOLLOWING TREATMENT WITH CHEMOTHERAPEUTIC AGENTS

Several examples of alterations of biodistributions of radiopharmaceuticals as the results of toxicities have been reported in the patients receiving chemotherapeutic agents. In the present study, alterations of biodistributions of Ga-67 citrate and Tc-99m MDP were investigated in rats following treatment with various chemotherapeutic agents. Antibiotics of mitomycin C, adriamycin, daunomycin, bleomycin and gentamycin, antimitabolite of methotrexate, and miscellaneous agents of vincristin and cisplatin were studied. All of these agents were administered into rats on the same method and basis of mg/m² of maximum tolerated dose as that in man. 5-10μg/kg of Ga-67 citrate was administered into the tail vein of rats 4-5 days after treatment with chemotherapeutic agents, and 10μg/kg of Tc-99m MDP was also administered 18 hours following Ga-67 administration. Uptake of Tc-99m MDP 3 hours after injection was obtained. In these treated rats with chemotherapeutic agents, alterations of biodistributions were observed. Among them, alterations of kidney and liver uptakes were extremely remarkable.


Three F-18-labeled pyrimidines F-18-5F, F-18-FUR and F-18-PDUR were examined regarding tissue distribution and tumor uptake in ascitic hepatoma AH109A-bearing rats. The tumor uptakes of F-18-5FU and F-18-PDUR were identical except for the period just after inoculation when F-18-PDUR uptake surpassed F-18-5FU uptake. The tumor-to-organ ratios obtained with F-18-PDUR were always 1.5 to 3 times higher than F-18-5FU and F-18-PDUR. We concluded that F-18-PDUR was a proper radiopharmaceutical for tumor imaging.

Positron emission tomography of a rabbit tumor located on the chest with F-18-PDUR clearly showed the tumor within one hour. Uptakes of F-18-PDUR in various tumor cell lines, such as MM48, and F-18-PDUR derived from mouse mammary carcinoma, were also examined. We found uptake in MM48 was higher than that in FM3A and AH109A. This suggested the different tumor uptake of F-18-PDUR may be related to tumor's viability.