1519

DEVELOPMENT OF RADIOPHARMACEUTICALS FOR THROMBUS DETECTION (II). Ga-67-DF-FIBRINOGEN, A NEW EXCELLENT THROMBUS IMAGING AGENT.

Y. Omomo, A. Yokoyama, J. Suzuki, H.Tanaka. Dept. of Radiopharmaceutical Chemistry, Faculty of Pharmaceutical Sciences, Kyoto University. K. Horiuchi, K. Yamamoto, N. Tamaki, Y. Ishii and K. Torizuka. Dept. of Nuclear Medicine, School of Medicine, Kyoto University, Kyoto, Japan.

Ga-67 labeled fibrinogen was prepared as a new deep-vein thrombus imaging agent, using deferoxamine as a bifunctional chelating agent. Excellent physicochemical and biological properties of Ga-67-DF-Fibrinogen was obtained. Isotopic clottability was more than 85%. High stability in vitro as well as in vivo was observed. Studies carried out in white rabbit with induced thrombi in the femoral vein showed thrombus-to-blood radioactivity ratio of 11.7, comparable to values estimated with I-131-Fibrinogen, 24 hr after the tracer administration. Remarkable visualization of this thrombus with a scintillation camera provided evidences for the great applicability of this easy to label radiopharmaceutical of gallium, with promissing use as Ga-68, a positron emitter, is available from a generator.

1520

BASIC STUDY OF VENOUS THROMBUS IMAGING BY USING Ga-67-DF-FIBRINOGEN (2).

K.Yamamoto, K.Horiuchi, N.Tamaki, Y.Ishii, K.Torizuka, Y.Ohmomo*, J.Suzuki*, A.Yokoyama*, and H.Tanaka* Dpt. of Radiology and Nuclear Medicine, and Faculty of Pharmaceuticals*, Kyoto University, Kyoto.

I-125-Fibrinogen uptake test has been used for the diagnosis of the thrombus in the lower extremities, however, it is difficult for this test to image the site of the venous thrombus.

We attempted to evaluate Ga-67-DF-Fibrinogen, the newly developed radiopharmaceutical, as thrombus imaging agent.

Ga-67-DF-Fibrinogen was injected to the rabbits bearing the thrombus induced by rt.-femoral vein clipping and scintigrams were obtained at every thirty minutes for 5 hours and at 17 hours after injection.

These datas were also recorded to computer in order to analyze the change of radionuclide activities.

The thrombus to back ground activity ratio became 2.5 at 3 hour after injection and thrombus could be detected scintigraphicaly.

The image obtained at 17 hours after injection revealed the thrombus as a hot spot with excellent contrast.

In conclusion, Ga-67-DF-Fibrinogen might be a promising radiopharmaceutical for venous thrombus imaging.

1522

ELECTRON DISTRIBUTION OF BONE-SEEkING AGENT.

H. Shinohara and Y. Koga Department of Radiology, Showa University Fujigaoka Hospital. Yokohama

The electron distribution of methylenediphosphonate molecule (MDP), hydroxyethylenediphosphonate (HEDP), hydroxymethylenediphosphonate (HMDP), and dihydroxymethlenediphosphonate (DHMDP) was calculated approximately by the molecular orbital (MO) method in order to examine the physicochemical property of bone-seeking agents. The basic concept of the MO method is to find an approximate electronic wave functions for a molecule by assigning to each electron a one-electron wave function which in general extends over the whole molecule. The one-electron wave function was constructed from a linear combination of atomic orbital (AO) of the atoms in the molecule. The electron density on each atom in above molecules was given in Table 1.

	P—O	C—O	
MDP	-0.6102		
HEDP	-0.5935	-0.3006	(Table 1)
HMDP	-0.5927	-0.2896	
DHMDP	-0.5910	-0.3034	

(values indicate the electron density on oxygen atoms for P-O bond or C-O bond)

It can be seen that the electron density on oxygen atom of MDP is larger than tridentate molecules. As the difference of electron density between HEDP and HMDP is little, low adsorption of the former may be related to steric hindrance in the chemisorption.

1523

RADIODEGRADATION OF Tc-99m-(Sn)-COMPOUNDS.

M. Hayashi, K. Takahashi and M. Hazue Research and Development, Technical Department, NIHON MEDI-PHYSICS CO., LTD., Takarazuka.

The presence of free pertechnetate in solutions of Tc-99m-radiopharmaceuticals is one of the most serious problems among the radiochemical impurities. The appearance of pertechnetate results from the low labeling efficiency at the preparation or the instability of Tc-99m-radiopharmaceuticals. In either case, this phenomenon relates to the deterioration of the reducing reagents. As the factors deteriorating the reducing reagents, oxidants in the solution of radiopharmaceuticals and radiolysis are most crucial.

In this paper, we report the effect of radiation on the stability of bone scanning agents (Tc-99m). When the bone scanning agents were prepared with Tc-99m of high activity, the labeling efficiency was lowered significantly. We confirmed this effect to be the result of the oxidative radiolytic reaction. Furthermore, we quantitatively evaluated the effect of stabilizers such as L-ascorbate which inhibited the radiodecomposition of Tc-99m-radiopharmaceuticals. We report, also, influences of some organic impurities which are contained in the final labeled products.