Studies on Radiopharmaceuticals —Synthesis of New Renoscanning Agents and Their Evaluation—

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An attempt has been made to produce a new renoscanning agent which is faster excretion rate, lesser radiation exposure and cheaper cost than those of chlormerodrin. An agent, 1-(4-iodophenyl)-3-([3-(chloromercuri)-2-methoxypropyl] urea (abbrev.: IPCM) labeled with ^{125}I was prepared for the first time in four steps with 4-iodoaniline labeled with ^{125}I as a starting material. The kidney-affinity of the synthetic compound was examined by using male wistar rats. IPCM labeled with ^{125}I was given intravenously to the animals at a dose of 2.5 mg/kg (specific activity: 8.6 μCi/mg).

The distribution of ^{125}I in the organs at various intervals after dosing was calculated as a ratio to the concentration of muscle. The average ratio of kidney to muscle at different times was as follows; 43, 80, 104, 153, 200, 101 and 185 at 0.5, 1, 2, 3, 6, 12 and 24 hours, respectively. The kidney accumulated more ^{125}I than any other organs. The liver deposited less ^{125}I than the kidney, but much more than any of the other organs. When the whole body retention between chlormerodrin and IPCM labeled with ^{203}Hg was compared, it was found to be similar biphasic excretion curves for the two copounds. The rate of IPCM's excretion via the urine and feces were nearly the same. Some problems for the clinical application of IPCM were discussed in take account of the use of ^{123}I in future.

Uptake of Various Labeled Compounds into the Tumor Tissue

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Thirty-six labeled compounds were prepared and their affinity for the malignant tumor were examined by using the rats transplanted with Yoshida Sarcoma subcutaneously.

Of these, relatively high uptake into tumor tissue was observed in ten compounds of ^{131}I-fibrinogen, ^{67}Ga-citrate, ^{114m}In-chloride, ^{67}Ga-nitrate, ^{203}Hg-acetate, ^{114m}In-citrate, ^{46}Sc-citrate, ^{131}I-albumin, ^{46}Sc-chloride and ^{206}Bi-acetate. ^{131}I-fibrinogen and ^{131}I-albumin are protein. Hg and Bi are the elements of the sixth period in a periodic table and these elements have strong protein binding capacity. Ga, In and Sc are the elements of group