

pharmaceuticals, ^{99m}Tc -pyrophosphate were reported here.

Pyrophosphate kits were used to prepare ^{99m}Tc -labelling.

- 1) MIDORI JÜJI RI Co. Inc. shaking method
- 2) DAIICHI RI Lab. shaking method
- 3) DINABOT RI Co. Inc. electrolysis method

During Nov. '72 to Aug. '73 bone scintigraphy with ^{99m}Tc -pyrophosphate were carried out for 66 cases, in which 28 cases had totally 71 bone lesions by X-ray examination.

Scintigrams were obtained with scintillation camera, conventional rectilinear scanner or improved scanner which gives us 1/5 shortened minisized scintigram. But only with minisized scanning, we could observe main lesions of the bone clearly.

4~6 mCi of ^{99m}Tc -pyrophosphate was injected to a patient intravenously. 2 hours later, after urination, the scanning was started. Time for examination was about one hour on whole body or 30~40 minutes by neck to pelvis.

In normal studies, the characteristic findings were as follows:

- 1) In general, bone scintigraphy with ^{99m}Tc -pyrophosphate showed much background counting and dominant collection to the kidneys and urinary bladder because ^{99m}Tc -pyrophosphate was excreted from urinary system.
- 2) Occasionally the thoracic spine and sternum were overlapped especially on anterior view.
- 3) Ilio-sacral joints were dominantly positive on posterior view.

The findings between bone scintigraphy and X-ray examination were well corresponding in our study.

Only 9 cases disagreed with each other because of:—

- 1) technical failure in scintiscanning or preparation of ^{99m}Tc -pyrophosphate (4 cases).
- 2) questionable findings in 5 cases, which we were observing their clinical courses.

The agreement between two studies is found in osteoblastic lesions more than osteolytic or mixed lesions.

In conclusion, ^{99m}Tc -pyrophosphate which is conveniently prepared, is a better radiopharmaceutical for bone scanning.

Bone Scintigraphy with ^{99m}Tc -pyrophosphate

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^{99m}Tc -pyrophosphate prepared by pyrophosphate kit (Daiichi Radio isotope Laboratory) is given to the patients in the dose of 4~6 mCi intravenously and bone scintigraphy: skull, spine (cervical, thoracic, lumbar), thorax, pelvis, and

extremities, are taken at 2 to 3 hours following the injection.

The cases studied are primary malignant bone tumor 6, haemangioma of bone 1, reticulosarcoma 1, bone metastasis 11, osteomyelitis 2,

aseptic necrosis 1, pseudoarthrosis 2, osteoporosis 1, Cushing syndrome 1 in total of 26 cases.

Generally speaking the accumulation of radio-nuclide is seen in the lesion demonstrated changes

on the radiogram. Both changes osteolytic and osteoblastic shows no significant difference in the findings on the scintigram.

Bone Scintigraphy with ^{99m}Tc -stannous Polyphosphate

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Whole body scintigrams with ^{99m}Tc -polyphosphate and ^{99m}Tc -pyrophosphate were taken in 55 cases having metastatic bone lesions suspected. ^{99m}Tc -polyphosphate was used in 40 cases and ^{99m}Tc -pyrophosphate in 15 cases. With either agent more lesions than the suspected or confirmed ones were detected on the scintigrams. In ribs and thoracic spines, especially, 11 out of 12 lesions in the former and 25 out of 38 lesions in the latter were discovered on the scintigrams only, while 7 out of 23 lesions were additionally found in lumbar spines. At present, there seems to be some problems about stabilities in these agents. In our series, liver images were occasionally found; for example, definite liver images were obtained in 5 out of the 40 cases of ^{99m}Tc -polyphosphate and in 2 out of the 15 cases of ^{99m}Tc -pyrophosphate. When spines were examined with these agents, the depth from the collimator interferes with the density of the spine on

the scintigram because of relatively weak gamma energy. In lumbar spines, for example, frontal view shows more density in the 5th than in the 1st, and more density in the 1st and less in the 5th on the posterior view. Therefore, it seems to be very important to know the patterns of normal distribution of these agents before the diagnosis is established.

Although blood clearance is more fast in ^{99m}Tc -pyrophosphate than in ^{99m}Tc -polyphosphate, images obtained between 1 and 5 hours after the intravenous injection does not seem to have significant differences in their qualities between these two agents. The sharpness of the images is more likely to be dependent upon how much activities are taken up by the lesions.

Although there are several problems to be solved, these agents are very useful in detecting bone lesions, especially with the help of whole body scanner.