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QUANTITATIVE ASSESSMENT OF METABOLIC BONE DISEASE IN RAT MODELS BY DOUBLE TRACER METHOD. H.Seto, F.Ihara, R.Futatsuya, T.Kamei, T.Soya, M.Kakishita. Toyama Med. & Pharm. Univ., Toyama.

Conventional radiological techniques for the early detection, differentiation, and quantification of metabolic bone disease are not clinically useful. After the introduction of Tc-99m phosphate compounds, bone imaging has become popular and evaluation of metabolic bone disorders has been reported. However the usefulness of modern radionuclide techniques for these purposes is still controversial.

We performed to measure the uptake ratios of two radiopharmaceuticals as a method for distinguishing states of abnormal bone metabolism. Nutritional osteoporosis and osteomalacia were produced in young rats and compared to a control group.

24-hour whole-body retention (WBR) of Tc-99mMDP in the osteomalacic group was significantly higher and no significant difference was noted in the osteoporotic group when compared with the control. 24-hour WBR of Ca-47 in the osteomalacic group, however was significantly lower and in the osteoporotic group was significantly higher at 4 weeks. 24-hour WBR ratios were correlated well with femoral uptake of the radionuclide. 24-hour WBR values of Ca-47 at 2 weeks revealed significant differences among these three groups, suggesting the possibility of early detection and differentiation of metabolic bone disease.

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BONE SCINTIGRAPHY ON MALIGNANT TUMOR ASSOCIATED WITH HYPERCALCEMIA. M.Fukunaga, N.Otsuka, T.Sone, K.Nagai, A.Muranaka, T.Furukawa, S.Yanagimoto, T.Tomomitsu and R.Morita. Kawasaki Medical School, Kurashiki.

It is not rare that hypercalcemia occurs in the advanced case or end stage of cancer. As the complication of hypercalcemia gives poor prognosis in patients, it is necessary to find hypercalcemia as rapid as possible and initiate therapy. In present study, bone scintigraphic examinations using Tc-99m-MDP were performed in 20 malignant tumor associated with hypercalcemia (MTH) (7 breast cancer, 4 lung cancer, 3 head and neck tumor, 2 multiple myeloma, 2 prostatic cancer, 1 hepatoma and 1 unknown origin), and the bone images were interpreted. On bone scintigram, the findings of apparent metastasis or involvement were observed in 10 cases (breast cancer and multiple myeloma). On the other hand, findings of "normal image" or diffusely increased accumulation of RI were obtained in half of cases (lung cancer and head and neck tumor). In this group the existence of humoral hypercalcemia was suspected. Thus, it was shown that bone scintigraphy was useful method in the recognition of pathophysiology in patients with MTH.

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A SEMI-QUANTITATIVE STUDY OF BONE SCINTIGRAMS -WITH SPECIAL REFERENCE TO INFANTILE RENAL DISEASES-. K.Morozumi, H.Kurokawa, M.Hashimoto, K.Masuda, T.Arai, K.Ikei and H.Hashimoto. Department of Radiological Technology, Saitama Childrens' Medical Center, Saitama. S.Akashi and H.Mochizuki. Division of Nephrology, do.

During a period of July 1984 to May 1985, a total of 78 times of bone scintigraphy were performed on 52 cases of infantile renal diseases such as nephrosis, chronic nephritis, IgA nephropathy and renal insufficiency. For each case, Tc-99m-MDP was injected i.v., ROI being set up intrarenally. Time activity curve was determined over 20 min. immediately thereafter. Scintigrams were taken 1, 2, 3 and 4 hr. later. MDP-labeling rate was determined each time by simple paper chromatography.

On both chronic renal insufficient and renal hypofunctional group and steroid-administered group, femoral epiphysis/diaphysis (E/D), femoral diaphysis/soft tissue [B/S(D)] and femoral epiphysis/soft tissue [B/S(E)] were determined, and comparative studies revealed the following conclusions:

- 1) Chronic renal insufficient group showed lower values of both E/D ratio and B/S(E) ratio than normal group.
- 2) A decrease in dose of steroid preparation led to lowering of both E/D ratio and B/S(E) ratio.
- 3) B/S(E) ratio showed a significant correlation with the amount of osteocalcin in blood.

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THE DISTRIBUTION OF TC-99M-HMDP WHOLE BODY BONE SCINTIGRAM IN PATIENTS WITH SECONDARY HYPERPARATHYROIDISM. A. Iida, T. Tamaki, K. Kurono, K. Morozumi, F. Yoshida*, T. Fujita**, M. Matsuo and M. Kono. Nagoya City University Medical School, Nagoya. * Narita Memorial Hospital, Toyohashi. **Nagoya Memorial Hospital, Nagoya.

Secondary hyperparathyroidism is sometimes observed in patients with chronic renal failure. There are some reports that the distribution of whole body bone scintigram in these patients is different from normal one. In order to make these data more useful, we try to make a design of the distribution of whole body bone scintigram in patients with secondary hyperparathyroidism. Twelve patients with secondary hyperparathyroidism and five patients as control were studied by this method. This method is very simple and easy for follow-up study of the patients with secondary hyperparathyroidism.