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EVALUATION OF In-111 LEUKOCYTE IMAGING IN PATIENTS WITH RHEUMATOID ARTHRITIS. K.Uno, S.Uematsu,T.Miyoshi,M.Kawana,N.Arimizu, N.Matsui,S.Inoue,J.Nagase,T.Murata,K.Nohira, G,Uchiyama and Y.Kitakata. Chiba University School of Medicine. Chiba.

Rheumatoid arthritis(RA) is regarded as a chronic diseases though, an active change in synovial membranes manifests a pattern of acute inflammatory process where large number of leukocytes migrate to. This study was performed to evaluate usefulness of the leukocyte imaging in patients with RA. Thirty patients were so far studied. Their ages ranged from 29 to 73 years, female to male ratio was 6.5:1, and average period from onset of disease was 18 years. Stage of disease by Steinbrocker's classification ranged I to IV in these group of patients. Autologous polymorphonuclear leukocytes were separated, labeled with 0.5-1 mCi of In-111-oxine and readministered to the patients. Imaging was performed at 24 hours. Clinical symptoms of pain and swelling in 60 wrist joints were compared with the accumulation of leukocytes. Ninety one percent(20/22) of wrist joints and 85%(23/27) of knee joints showed positive agreement of both categories. Stage III patients showing x-ray bone changes in knee joints well accumulated In-111 leukocytes in lesions. It is concluded that In-111 leukocyte imaging revealed a reliable procedure for monitoring RA.

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TWO-COMPARTMENT ANALYSIS OF DYNAMIC BONE SCINTIGRAPHY IN MAXILLO-FACIAL REGION.(PART 1;STUDY OF MATHEMATICAL ANALYSIS). S.Wada, N.Kitamura,K.Hayama and K.Maeda. Nippon Dental University.Niigata Faculty.Niigata.

The method for mathematical analysis of the dynamic curves on maxillo-facial bone scintigraphy was studied.The analytical model taken into this study was 2-compartment model which consists of nutrient artery of bone and bone.Because of the existance of back ground of major artery and soft tissue ,it was necessary to consider those effects. Tc-99m MDP was used as the imaging agent, and was administrated at 0.25 mCi/Kg. After setting the head of γ-camera,sequential imaging data were stored in computer every one frame(15 seconds)immediately after i.v. injection to an hour,and furthermore the data of 2hrs and 4hrs were stored too. The analysis was performed after setting the ROI .Data processing system was SCINTIPAC-1200 (SHIMADZU CORPORATION).We got the solution of the model under the condition that RI was diffused into blood,the solution consists of four parameters;saturated tracer dose in bone blood flow(K),clearance factor of tracer from blood(β),inter compartmental rate constant from blood into bone(Λ),that out of bone into blood(λ).The computer program was made to calculate parameters (K,Λ, λ) by fitting the data during 25 minutes and 60 minutes,and 2hrs and 4hrs after i.v. injection.The fitting method was the method of least squares with perturbation.Individual parameter was calculated on each patient.

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TWO-COMPARTMENT ANALYSIS OF DYNAMIC BONE SCINTIGRAPHY IN MAXILLO-FACIAL REGION.(PART 2;CLINICAL STUDY). N.Kitamura,S.Wada, K.Hayama and K.Maeda. Nippon Dental University.Niigata Faculty. Niigata.

The qualitative diagnosis of bone scintigraphy has not been evaluated sufficiently. One of the reasons,the method of bone scintigram diagnosis has been performed by the degree of accumuration of radioactivity. Then we tried to obtain the information about the qualitative diagnosis by means of the mathematical analysis of dynamic bone scintigraphy for the patients with jow bone disease.

The examination was performed by intravenous administration of Tc-99m MDP (0.25mCi/Kg).And sequential image data were stored in computer immediately after i.v.injection to an hour,furthermore the data of 2hrs and 4hrs were stored too. Using the 2-compartment model which consists of bone and nutrient artery of bone,the analysis of dynamic curves were performed by on-line-digital-computer.And calculated two parateter; saturated tracer dose in bone blood flow(K), inter comprtmental rate constant from blood into bone(Λ),were discussed on each patient.

In conclusion,the both values of K and Λ showed high trend in the patients with malignant tumor,and were slightly high values in the patients with fracture,bone cyst and benign odontogenic tumor,and only the Λ was high trend in fibrous dysplasia and actinomycosis.

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EVALUATION OF DYNAMIC BONE SCINTIGRAPHY IN DIFFERENTIAL DIAGNOSIS OF BONE AND SOFT TISSUE DISEASES. N.Hoshiko,S.Tomiguchi,Y. Yamashita,Y.Takagi,H.Bussaka,Y.Hirota,H. Yoshii and M.Takahashi. Department of Radiology, Kumamoto University School of Medicine.

Dynamic bone scintigraphy with Tc-99m MDP was evaluated whether the dynamic bone scintigraphy could be useful in the differential diagnosis on the basis of 63 cases of bone and soft tissue diseases. Sequential scintigraphy was obtained at various time intervals and named the arterial, venous, blood pool and early static phases. Static image was also obtained 3 hrs after the sequential study. In primary malignant bone tumors local deposition of the tracer was observed in 83.3% on the arterial phase. However, in benign diseases and metastatic bone tumors local deposition of the isotope was observed only in 36.7% and 42.1%.

In the malignant soft tissue tumors the accumulation was observed in 100% from the arterial, venous to blood pool phases, however it was not observed on the static images.

The dynamic bone scintigraphy was useful to differentiate primary malignant bone tumors from malignant soft tissue tumors as well as to differentiate primary malignant bone tumors from metastatic bone tumors or benign diseases.