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AN EVALUATION OF GA-67 LUNG UPTAKE FOR PREDICTING THE PROGNOSIS OF INTERSTITIAL LUNG DISEASES. S.Fujishima, M.Kuroda, Y.Suzuki, M.Kanazawa, T.Yokoyama, I.Nishiguchi, A.Kubo and S.Hashimoto. Department of Medicine and Department of Radiology, Keio University School of Medicine.

Ga-67 lung scintigraphy is routinely used to assess the "activity" of interstitial lung diseases (ILD). The method has not been established as useful in predicting the prognosis of ILD, although it may represent the degree of "alveolitis" in these disorders. We examined the clinical course in 30 patients with sarcoidosis, 24 patients with idiopathic pulmonary fibrosis (IPF) and 12 healthy controls, and quantified the degree of Ga-67 lung uptake (Visual Index : VI) using the method by Line et al. (1978). The VI values increased in the patients with sarcoidosis (56±47 : mean±SD) and IPF (88±52) as compared with the healthy controls (28±18). In patients with sarcoidosis, the VI values show no difference between subgroups classified with respect to pulmonary involvement or serum angiotensin converting enzyme (ACE) level. Serum ACE correlated well with the hilar uptake ($r=0.80, p<0.001$). No patients with sarcoidosis died during the observation period, but those with high VI values deteriorated clinically. In patients with IPF, the VI values were not different between subgroups of living (90±56) and deceased (88±52) patients in two years after the initial evaluation. In conclusion, we are unable to predict the prognosis of ILD from the Ga-67 lung uptake.

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Usefulness of Alveolar Permeabilith by measuring clearance of inhaled Tc-99m DTPA. T.Suzuki, O.Kubomura and M.Iio. Nakano National Chest Hospital. Tokyo

Nowadays Tc-99m DTPA inhalation method was used to measure alveolar permeabilty. We investigated the factors which had influence of clearance of Tc-99m DTPA. Distribution of inhaled Tc-99m DTPA divided 3 groups. The first one was homgeneous distribution and the second one was unilateral lung had homogeneous distribution and the third one was bilatelal lung had central deposit of DTPA. Normal lung and most of idiopathic interstitial pneumonia were the first group. Pulmonary emphysema and chronic bronchitis had a tendency to the third group. Clearance of DTPA at apex was more rapid than at base in the seated position. This was affected by that alveolar surface per unit at apex was larger than that at base. The most effective factor was alveolar surface per unit and next one was pulmonary blood flow. T 1/2 of clearance of DTPA was correlated with DLco measured single breath hold method in normal lung. The other hand, T 1/2 of clearance of DTPA in COPD did not denote alveolar permeability,however these disease had short T1/2, because the deposition of DTPA was central bronchial wall and clearance from these area was affected by proliferation of vessel in the bronchial wall. After anti-cancer therapy, clearance of DTPA in the opposite normal lung had become rapidly. Anti-cancer drugs dameged alveolar epithelium and accelerated alveolar permeability. This was a possibility that alveolar damege induced anticancer drugs become clincal problem when cancer was completely cured and patients lived a long time.

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ASSESSMENT OF PULMONARY EPITHELIAL PERMEABILITY IN INTERSTITIAL LUNG DISEASE - ANALYSIS OF AEROSOL DEPOSITION PATTERN IN THE LUNGS. M. Kanazawa, Y. Suzuki, A. Ishizaka, M. Kuroda, S. Fujishima, T. Yokoyama, T. Hashimoto, Y. Okano, A. Kubo, S. Hashimoto. Department of Medicine and Radiology, School of Medicine, Keio University, Tokyo.

The radioaerosol deposition pattern in the lungs and its effect on the assessment of pulmonary epithelial permeability was described. Tc-99m-DTPA (diethylene triamine penta acetate) aerosol scintigram was studied in 27 healthy nonsmokers, 15 smokers, 47 patients with pulmonary fibrosis (PF), and 10 patients with chronic obstructive pulmonary disease(COPD). The scintigraphic images were classified into 4 grades, 0; homogeneous distribution, 1; patchy distribution, 2; hot spots with partial defect, and 3; hot spots with little deposition in the lung field. The rate constant was used as a parameter for the pulmonary epithelial permeability. The rate constants were increased in the smokers and patients with PF. The nonsmokers, smokers and 36 patients with PF were classified to the grade 0 or 1, suggesting good aerosol penetration to the lung periphery. The patients with COPD showed the grade 2 or 3 and their rate constants were not elevated. It was suggested that aerosol deposition to the central airways should be analyzed because it might cause to underestimate the pulmonary epithelial permeability.

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CHANGE IN PULMONARY EPITHELIAL PERMEABILITY BY HISTAMINE INHALATION. Y.Suzuki, M.Kuroda,S.Fujishima,M.Kanazawa,T.Yokoyama, J.Sakurada, A.Kubo and S.Hashimoto. Department of Medicine and Radiology, School of Medicine, Keio University, Tokyo.

We investigated the effect of inhaled histamine on the pulmonary epithelial permeability estimated by using Tc-99m DTPA (diethylene triamine penta acetate) aerosol inhalation, and examined a quantitative relationship between the permeability and the airway responsiveness. Fourteen healthy nonsmokers were studied. The provocative concentration of histamine to decrease $FEV_{1.0}$ more than 20% (PC_{20}) was determined by inhaling from 0.1% to 3.2% histamine for 2 minutes. On the following day, pulmonary epithelial permeability was estimated from the rate constant (kep, %/min) of Tc-99m DTPA. The mean value for PC_{20} was 1.53 ± 1.36%. The control kep value was 0.63 ± 0.16 %/min. On histamine inhalation, the kep value increased at the PC_{20}. The kep value started to increase at the lower histamine concentration than the PC_{20} . We could not find a dose-response relationship between the inhaled histamine concentration and the airway responsiveness . After the end of histamine inhalation, the kep values returned to the pre-inhalation level in several minutes. In summary, the inhaled histamine induced a rapid and reversible increase in the pulmonary epithelial permeability, but we could not detect a dose-response relationship.

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