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NUCLEOMEDICAL APPROACH TO PNEUMOCONIOSIS. K.Sato, M.Tanabe, T.Tamai, N.Itano, Y.Takeda, H.Hayashi, M.Miyake and M.Yamamoto. Okayama University, Radiotherapeutical Department.

Referring to pneumoconiosis usefulness of applying the nucleomedical therapy was studied in comparison with the chest-X-ray examination and lung function tests for pneumoconiosis.

As to MTT between the normal and II type a statistically significant difference was observed in the right upper middle lung field, which however was not been between the normal and I type. As to  $\dot{V}/\dot{Q}$  no significant difference was noted between the normal and I or II type. Compared with diagnostic standard of obstructive pulmonary diseases by %VC, FEC 1.0%, the detection of obstructive pulmonary diseases by nucleomedical process is far better superior, but when studied also in consideration of  $V_{25}/Ht$ , in those diagnosed as normal upon various nucleomedical examinations sometimes abnormal values of  $V_{25}/Ht$  only were found.

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REGIONAL DISTRIBUTION OF RESIDUAL GAS VOLUME IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE. K.Kawakami, Y.Mori, Y.Fukuda, Y.Hata, N.Katsuyama, T.Shimada, S.Tominaga. Jikei University School of Medicine, Juntendo University School of Medicine. Tokyo.

In this presentation, we studied the relationships between the regional RV(RVr) and overall RV, and RVr and closing volume (CV). Method: After seven minutes of re-breathing of Xe-133 gas in a closed circuit, the regional distribution of lung volume at the TLC level(TLCr) was measured. Following this manipulation, the air was slowly inhaled from the RV to the TLC level. This represents the distribution of RVr. RVr/TLCr was calculated and a longitudinal distribution of RVr/TLCr was obtained. Results: The results of the regional distribution of the residual gas were classified into the following four different types: A; Increase in the upper lung, B; Regional increase in the lower, C; Homogeneous distribution in total lung, D; Increase in lower lung and decrease in upper lung. RV/TLC measured by the Xe method indicated significant increase from A to D, consecutively. One third of COPD cases showed asymmetrical patterns in the right and left lungs. All of the cases which showed type A in both lungs had normal CV Value. But a several cases having normal CV value did not show type A in unilateral lung. This method of Xe-133 inhalation is useful to early detection of regional onset of small airway disease, even with the cases showing normal CV value.

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THE DISTRIBUTION OF Kr-81m WITH He AND SF<sub>6</sub> IN THE PATIENTS OF ASTHMA. Y.HATA, Y.MORI, N.KATSUYAMA, T.SHIMADA, S.TOMINAGA, Y.IIKURA and K.KAWAKAMI. Jikei University School of Medicine, National Children Hospital, Juntendo University School of Medicine. Tokyo.

This investigation was undertaken to survey the difference of the distribution of various gases during asthmatic attack. Eighteen asthmatic children were studied with Kr-81m gas, using 80%He + 20%O<sub>2</sub>, room air and SF<sub>6</sub> as carrier gases. The Kr-81m was inhaled as a bolus with carrier gases as changing the inspiratory flow rate. Asthmatic attack was induced by exercise or acetylcholine. In 9 of 21 studies on 18 subjects, the ventilation defects varied as the carrier gases were altered, and in 8 studies as the flow rate. In 7 studies, there was no difference in the defects with the various carrier gases and flow rate. In the case of induced asthma, the changes of defects were more prominent as the carrier gases were altered than the flow rate. The difference of defects between SF<sub>6</sub> and room air was greater than that between room air and He.

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GA-67 LUNG SCAN FOR EARLY DETECTION OF DRUG-INDUCED PNEUMONITIS. H.Nakajima, N.Kobayashi, S.Takashima, H.Sawa, T.Fukuda, F.Ikeda, K.Hamada, H.Ochi, Y.Onoyama, K.Terakawa S.Fujimoto, N.Kurihara and Y.Kobayashi. Osaka City University Medical School, Department of Radiology, First Internal Medicine and Pathology.

Increased pulmonary accumulation of Ga-67 was observed in six patients preceding the appearance of any abnormal findings in both chest X ray and blood gas data. All of them had received multiple courses of chemotherapy for various malignancies.

To assess the usefulness of Ga scan for early detection of the drug-induced pneumonitis, its accumulation in the lung of Wister rats was studied experimentally. Bleomycin (BLM) was injected subcutaneously at a dose of 10 mg/kg everyday for 2 to 12 days. Each animal received an intravenous injection of 100  $\mu$ Ci of Ga-67 24 hours after the last BLM injection, and was sacrificed 48 hours thereafter. Radioactivity of tissue samples was measured by scintillation counter. Lung to liver ratios of the activity were elevated for the group of animals receiving more than 6 doses of BLM(10-15% of the liver) compared with those for the control group(2-4%). Histologically, the increased lung uptake of Ga-67 was closely correlated with the degree of interstitial pneumonitis.