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DOES BRONCHODILATION WITH A BETA 2-STIMULATOR SALBUTAMOL AND AMINOPHYLLINE ACCELERATE MUCOCILIARY CLEARANCE FUNCTION IN PATIENTS WITH BRONCHIAL ASTHMA ? T.Isawa, T.Teshima, T. Hirano, A. Ebina and K. Konno. Department of Medicine, Research Institute for Chest Diseases and Cancer, Tohoku Univ., Sendai.

Beta-2 stimulators accelerate ciliary beat in vitro, and are thought to act similarly also in vivo. The purpose of the study was to determine if salbutamol improved mucociliary clearance function in bronchial asthma. Radioaerosol inhalation lung cine-scintigraphy and lung function tests were performed in 10 patients with bronchial asthma in remission before and after inhalation of salbutamol following intravenously administered aminophylline. Although a significant improvement was documented in bronchodilating effect of the treatment by a more homogeneous distribution of inhaled radioaerosol in the lungs, an increased alveolar deposition ratio, a decreased airway deposition ratio immediately after the treatment and improvement in FVC, FEV1.0%, MMF, $\dot{V}_{50}$ and $\dot{V}_p$ in lung function data, no recognizable effect was seen on mucociliary clearance mechanisms in the lungs either visually and qualitatively or quantitatively by radioaerosol inhalation lung cine-scintigraphy. Bronchodilation induced by inhaled salbutamol, a beta-2 stimulator following aminophylline infusion does not seem to improve mucociliary clearance mechanisms in the lungs in vivo.

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AEROSOL DEPOSITION WITH FORCED EXPIRATION. H.Maeda, M.Matusita, D.Hamanaka, T.Odori and Y.Ishii, Fukui Medical School, Fukui.

Lung scintigraphies with Kr-81m continuous breathing, with quiet breathing of Tc-99m phytate aerosols and with quiet inspiration and forced expiration were carried out in 16 subjects. First the scintigraphy of Kr-81m breathing was taken. Second, the subject quietly breathed aerosols generated from a nebulizer, then another scintigraphy was taken. Finally, the subjects repeated gentle inspirations followed by forced expirations for several times. These three kinds of lung scintigraphies were compared visually and computationally. Abnormal hot spots appeared or disappeared in 12 subjects. Both appearances and disappearances of the local depositions seemed to indicate the degrees of the airway abnormalities. With this forced expiration technique, airway abnormality which could not be detected with the conventional quiet breathing of aerosols would be found out. The lungs were divided into three regions, outer, center and inner regions, and also divided into upper, middle and lower regions. Depositions in the outer region after the forced expiration increased inversely to the deposition in the inner region, while there was no correlation in the upper and lower lung field deposition. These results might give an insight to the mechanisms of aerosol deposition in the lung.

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DETECTION OF PULMONARY PARENCHYMAL DAMAGE IN ATRIAL SEPTAL DEFECT (ASD) BY TC-99M MAA PERFUSION SCAN AND TC-99M RBC POOL SCAN. K.Hayashida, N.Nishimura, T.Uehara and T. Shimonagata. Dept. of Diagnostic Radiology, National Cardiovascular Center, Suita, Osaka

Sixty cases of ASD were classified into three group by perfusion scan visually. (I) Normal (n=15), (II) Altered (n=22), (III) Mottled (n=23). Each group was compared with hemodynamic data of the lung; mean pulmonary arterial pressure (PAP), mean left atrial pressure (LAP), pulmonary arteriolar pressure (PAR) and Qp/Qs. Result was as follows.

	(I)	(II)	(III)
mean PAP(mmHg)	16.8±3.8**	21.3±3.8**	42.0±11.6**
mean LAP(mmHg)	3.8±2.5*	5.7±2.7*	4.3±5.2
PAR(dyn·sec·cm ⁻⁵)	110±64	113±48**	490±271**
Qp/Qs	2.8±1.0	3.3±1.4**	2.0±1.0**

(* p<0.05, ** p<0.01)

Eight cases of ASD were performed with oxygen inhalation test (5 L/min, during 15 min) by RBC pool scan in sitting position. Pulmonary blood count (PBC) of right upper lung field (RUF) was recorded during one minutes at initial, 5 min, 10 min and 15 min.

	initial	5 min.	10 min.	15 min.
RUF 100**	95.0±5.1	92.3±6.8**	89.6±7.9	

There was a correlation (R=-0.65) between mean PAP (<30mmHg) and decreased rate of PBC in RUF. Scintigraphic classification of atrial septal defect correlated well with severity of pulmonary parenchymal damage, and decreased rate of PBC indicated reversibility of pulmonary vasculature.