

276

DRUG EFFECTS ON REGIONAL PULMONARY PERFUSION.

T. Isawa, T. Teshima, T. Hirano, A. Ebina, K. Shiraiishi, and K. Konno. The Research Institute for Chest Diseases and Cancer, Tohoku University, Sendai.

Regional pulmonary perfusion is primarily regulated by alveolar O_2 tensions. Alveolar hypoxia induces regional hypoxic vasoconstriction and alveolar hyperoxia, hyperoxic recruitment and/or dilation of the regional pulmonary vascular beds. The purpose of the present study was to elucidate the effects of various drugs generally administered upon regional perfusion in the right upper lobe (RUL) of the anesthetized adult mongrel dogs. The RUL was artificially ventilated with N_2 , air and 60% O_2 in N_2 to induce alveolar hypoxia, normoxia (or lesser hypoxia) and hyperoxia, respectively, while the remainder of the lungs maintained a spontaneous air breathing. In the neurologically intact lung lobe, aminophylline didn't revert hypoxic vasoconstriction, but isoproterenol did. Aminophylline showed a vasodilating action under alveolar normoxia (or lesser hypoxia) and hyperoxia, but isoproterenol didn't. Dopamine and propranolol themselves didn't show any effect on regional pulmonary perfusion. Propranolol suppressed the action of isoproterenol under alveolar hypoxia. Salbutamol didn't show a vasodilating action under alveolar hypoxia. Prostaglandin $F_{2\alpha}$ showed some vasoconstrictive action under alveolar hyperoxia which originally induced either vascular recruitment and/or dilation. In the denervated lung lobe, isoproterenol showed a similar vasodilating action as in the normal lung lobe. Regional hypoxic vasoconstriction seems to be partially reversible through the stimulation of the β (probably β_1) adrenergic system.

278

CLINICAL SIGNIFICANCE OF RADIOAEROSOL SCINTIGRAPHY. Y. Ishii, T. Suzuki, H. Ito, Y. Yonekura, K. Yamamoto and K. Torizuka. Kyoto University Medical School, Kyoto, Japan.

We had established advancing stagings of radioaerosol inhalation scintigraphic findings of the patient with chronic obstructive pulmonary disease (COPD) consisting of I=normal distribution, II=irregular distribution (ID), III=additional hot spot formation (HS), IV=additional inhalation defect; those of which correlated well with degree of airway obstruction documented by conventional lung function tests. On examining flow-volume curve simultaneously monitored, HS, related closely with increased inspiratory flow rate which probably a compensational phenomena of advancing expiratory failure of this disease. Model study also substantiated this fact. On simultaneous monitoring of the single-breath nitrogen washout test, ID correlated well with the slope of the phase III of this curve. Thus, the radioaerosol scintigraphy thought to be a regional expression of ventilatory failure of the COPD, in which HS represented the resistance dominated failure at the central airways and ID did the compliance dominated failure at the peripheral airways.

277

GENERALIZED MULTIPLE PERFUSION DEFECTS IN LUNG SCAN. K. Asakura, Y. Kobayashi, Y. Ono, K. Matsui, T. Tanaka, J. Noda and Y. Yamamoto. Yokohama City University School of Medicine and Kanagawa Adult Disease Center. Yokohama.

Three hundred and thirteen patients have been investigated by means of perfusion lung scan with a high resolution large field scintillation camera. Seventy-two patients among them, showed generalized multiple defects on their Tc-99m MAA scan. Scintigraphic patterns were classified as follows: Group1; generalized perfusion defects in both lungs with defined lung contour (24), Group2; with irregular contour (34), Group3; multiple perfusion defects larger than size of a segment in both lungs (14). Clinical diagnosis of them were chronic interstitial pneumonia, chronic bronchitis, emphysema, normal and so forth. Among the 24 patients in Group1, 10 were diagnosed as normal. It may be concluded that patients of Group1 are normal if they have no complaints and their other laboratory findings are normal. But, their prognostic significance should be determined by further investigation.

279

UNILATERAL HYPOPERFUSION LUNG. Y. YAMAGISHI, S. SHIIBA, K. HONDA, F. NAKAZAWA, F. HIKITA, S. HOSOI, A. OKUYAMA, S. MITANIHARA and H. OMIGAWA. Dep. of Radiology, Nippon Medical School. (Director; Prof. T. SAIYOH)

Unilateral hypoperfusion lung which shows homogenous decrease of activity of unilateral lung in the pulmonary perfusion scintigram by Tc-99m MAA have been studied. The scintigram in the cases of unilateral hypoperfusion lung were examined as compared with X-ray films at the point of lucency of the unilateral lung field. (opaque, lucent and hyperlucent) In some cases, ventilation scintigraphy with ^{133}Xe -gas was performed and evaluated. 52 cases are experienced in our department from Jan. 1973 to Oct. 1979.

Result:

	opaque	lucent	hyperlucent
lung cancer	14	12	1
effusion	9	9	0
post operation	8	0	8
foreign body	6	0	3
a-(hypo-) plasia	6	2	3
pneumonia	2	2	0
congenital heart disease	2	0	1
Swyer-James syndrome	1	0	0
mediastinal tumor	1	1	0
aneurysm	1	1	0
tuberculosis	1	1	0
misc.	1	0	1
	52	28	17