253

DEPOSITION AND CLEARANCE RATE OF INHALED Tc-99m MISA AEROZOL IN REGIONAL LUNG AREA.

K.Kimura,M.Otsuka,T.Hasegawa,H.Watanabe, S.Hasegawa,R.Hatakeyama,M.Oshima and M.Akisada. Institute of Clinical Medicine, University of Tsukuba. Ibaraki Pref.

The aerozol inhalation measurement with Tc-99m MISA (0.2-2 μ) using ultrasonic nebulizer and a large area scinticamera combined with computer has been employed to evaluate deposition and mucocilliary clearance in regional lung area of 30 patients with pulmonary disease. Deposition rates and clearance rates were calculated for each lung areas divided into nine zones (whole lung, left, right, bilateral upper, middle and lower). Regional deposition rate of radioactive aerozol correlated with regional ventilation measured with Xe-133 ($y=0.64x + 5.93$, $r=0.722$, $P<0.01$). In whole lung field, disappearance constant (λ) calculated from initial clearance curve of radioactive aerozol ($\bar{m}=-1.27\times10^{-4}$, n=20, SD 1.01×10^{-4}) correlated with $PaCO_2$ ($r=0.533$, $P<0.05$). But, no significant correlation were found between λ and other data of pulmonary function (%VC, FEV1.0%, RV/TLC, DLCO, PaO_2), and mean wash-out time measured with Xe-133 method. In regional area, arbitary divided into 24 zones, negative clearance indices ($\lambda i/\lambda t<0$) were found in perihilar areas. This findings seemed to be good parameter of mucocilliary dysfunction especially in the patients with COLD.

254

ESTIMATION OF DISTRIBUTION RATIO OF TL-201 AND Tc-99m HUMAN SERUM ALBUMIN IN LUNG.

T. Fujii, J. Hirayama, H. Kanai, K. Yano and M. Takizawa. The First Dept. of Internal Medicine and Div. of Radiology, Shinshu Univ. School of Medicine, Matsumoto.

In order to estimate of the pulmonary extravascular and intravascular volume, lung scintigraphies with Tl-201 and Tc-99m human serum albumin (HSA) were performed in patients with various lung and heart diseases, combining with perfusion lung scintigraphy of Tc-99m MAA. The radioactivity of injected dose of Tl-201 and Tc-99m HSA (T) was calculated from the serial images of them, and that of Tl-201 and Tc-99m HSA in unilateral lung (L) was calculated from the anterior image of them on which a isocount map of the perfusion lung scintigram was superimposed. The distribution ratios of Tl-201 and Tc-99m HSA were calculated by ratio of L to T.

The average values of L/T of Tl-201 in the right and left lung were 1.5 ± 0.9%, 1.2 ± 0.6% in healthy lung, 3.9 ± 1.5%, 2.0 ± 0.9% in diffuse interstitial pneumonia and 4.4 ± 1.8%, 2.6 ± 1.2% in heart disease, and those of Tc-99m HSA were 3.3 ± 1.1%, 2.0 ± 0.6% in healthy lung, 3.3 ± 1.3 %, 1.8 ± 1.0% in diffuse interstitial pneumonia and 4.6 ± 2.2%, 2.5 ± 1.1% in heart disease. These results suggest that joint use of scintigraphies with Tl-201 and Tc-99m HSA is clinically available for estimation of the pulmonary extravascular and intravascular volume.

255

ON THE SIGNIFICANCE OF ESTIMATING REDISTRIBUTION OF PULMONARY PERFUSION IN PATIENTS WITH CORONARY ARTERY DISEASE.

T.Tanaka,S.Kimata,M.Sekiguchi,K.Hirosawa, M.Maki,K.Kusakabe,H.Tazaki and T.Yamazaki. Tokyo Womens' Medical College. Tykyo.

To determine wether distribution of pulmonary perfusion can be used as a non-invasive method to estimate any of hemodynamic changes in patients(pts) with coronary artery disease(CAD),Tc99m-MAA digital perfusion images(DPI) were evaluated in 42 pts.DPI were estimated by the 3rd intercostal space-to-base count ratio(pulmonary redistribution index,PRI).

PRI	mPA(mmHg)	mPw(mmHg)	EF(%)	mPw/CO
-1	42.3+4.7	26.5+4.7	13.3+3.7	3.9+0.6
1-0.7	18.5+3.5	12.8+3.3	45.2+8.6	*2.5+0.4
0.7-	13.7+1.8	8.0+2.2	56.6+12.8	1.5+0.3

];p 0.001,*;p 0.01

The specificity of PRI for severe cardiac dysfunction(mPA≥30mmHg,mPw≥20mmHg,EF<30%) was 100%(33/33).PRI was considered abnormal if greater than 0.7. In pts with PRI<1 PRI correlated better with mPw/CO(r=0.75) than with mPw(r=0.68).The sensitivity of PRI for mPw/CO>2HRU was 91%(10/11) and the specificity was 82%(18/22).It is concluded that severe cardiac dysfunction can be easily detected by DPI. It is possible to estimate mPw/CO from PRI.

CO:cardiac output,EF;ejection fraction, mPA;mean pulmonary artery pressure,mPw; mean pulmonary capillary wedge pressure,

256

VENTILATION SCINTIGRAPHY FOR UNILATERAL HYPOPERFUSION LUNG.

Y.Yamagishi,F.Hikita, H.Nishikawa,H.Nakazawa,A.Okuyama,S.Magota, H.Ohmigawa,S.Takaiwa,N.Ariga,Y.Shinohara and T.Ohya. Dep. of Radiology, Nippon Medical school. Tokyo.

Unilateral hypoperfusion lung means here decreased unilateral activity of the lung on the perfusion scintigram with Tc-99m-MAA. Ventilation scintigraphy for unilateral hypoperfusion lung was performed in 17 cases with Xe-133 gas. Patient distribution and classification of ventilation-images in unilateral hypoperfusion lung were as follows.

	I	II	III	mixed	
Ca of lung	1	2	1	1	6
Pleural effusion	0	2	1	0	3
Postoperation	0	2	0	0	2
Agenesis of PA	1	0	0	0	1
Foreign body of bronchus	0	0	1	0	1
Swyer-James syndrome	0	0	1	0	1
Asthma	0	0	0	1	1
Misc.	1	0	1	0	2
TOTAL	3	6	4	4	17

I : normal ventilation scintigram in each phase of single breath, re-breath and wash out.
II : non activity in all phases.
III : delayed wash out

Presented by Medical*Online