

Comparison of ^{99m}Tc -Technegas SPECT with ^{133}Xe dynamic SPECT in pulmonary emphysema

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This study was undertaken to compare axial images of ^{99m}Tc -Technegas SPECT (Technegas) with those of ^{133}Xe gas dynamic SPECT in patients with pulmonary emphysema. There were 20 patients, 19 males and 1 female. All patients except one ex-smoker were heavy smokers with a mean age of 68.1 years. For Technegas scintigraphy, the patients inhaled 505 MBq ^{99m}Tc -Technegas in several tidal volume breaths in the supine position without breath holding. For ^{133}Xe gas scintigraphy, the patients inhaled 370 MBq ^{133}Xe gas. ^{133}Xe gas dynamic SPECT was performed in the equilibrium phase for the last minute of the 3 minute inhalation in a closed circuit, and in the washout phase for 6 minutes of inhalation in a semi-closed circuit, by means of a gamma camera with dual detectors (Picker model Prism 2000). Abnormal findings included heterogeneity, defects and hot spots on Technegas images and on retention images taken 3 minutes after ^{133}Xe gas washout. In 2 of 20 patients, the degree of abnormal findings on Technegas images depended on the area of ^{133}Xe gas retention in the washout phase. In 3 patients, the degrees of abnormal findings on both Technegas SPECT and ^{133}Xe gas dynamic SPECT images were equivalent. In the remaining 15 patients, more detailed findings and a greater area were shown by Technegas SPECT than ^{133}Xe gas dynamic SPECT. We conclude that in patients with pulmonary emphysema Technegas SPECT can demonstrate ventilation impairment more easily than ^{133}Xe gas dynamic SPECT.

Key words: Technegas, ^{133}Xe gas, dynamic SPECT, pulmonary emphysema