

Evaluation of lung clearance of inhaled pertechnegas

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Pertechnegas is a new ventilation agent produced by modifying the atmosphere of combustion of Technegas. Due to its rapid disappearance from the lungs, Pertechnegas has been suggested as useful in measuring pulmonary epithelial permeability. This study aimed to assess the reliability of ventilation scans with Pertechnegas to evaluate alveolar-capillary permeability. Six non-smokers with no evidence of pulmonary disease were investigated. Scintigraphic data were used to evaluate the site of Pertechnegas deposition (by assessing the Penetration Index [PI] of the gas), its clearance rate (by calculating the time to half-clearance [$T_{1/2}$]) and its lung distribution (by means of a pixel-by-pixel analysis). PI measurements produced a mean value of $88.8 \pm 13.3\%$ (range 69-117%). Time activity curves showed a fast clearance in all cases (mean $T_{1/2} = 10.7 \pm 2.1$ min, range 8.1-14.3 min). Comparison of statistical indices of uniform deposition (skewness and kurtosis) indicated satisfactory homogeneity of Pertechnegas distribution throughout the lungs. These data show that after inhalation Pertechnegas has a peripheral deposition and a homogeneous distribution in the lungs and is rapidly cleared through the alveolar-capillary barrier. In conclusion Pertechnegas can be recommended as a potential radiopharmaceutical for studying the pulmonary epithelial barrier.

Key words: technetium 99m-diagnostic use; pulmonary epithelial permeability; technegas