

Journal of Nuclear Medicine

jnm.snmjournals.org

J Nucl Med May 1, 2018 vol. 59 no. supplement 1 1616

Lung ventilation scintigraphy - what is the ideal radioaerosol?

Evbuomwan Osayande¹, Khushica Purbhoo¹ and Mboyo Vangu¹ Author Affiliations

¹Nuclear medicine and molecular imaging University of The Witwatersrand
Johannesburg South Africa

Abstract**1616**

Objectives: To assess if ^{99m}Tc MDP and ^{99m}Tc MIBI when used as radioaerosols are good substitutes for ^{99m}Tc DTPA in lung ventilation scintigraphy of patients with suspected pulmonary thromboembolism during sporadic supply or shortage of ^{99m}Tc DTPA. **METHODS** This was a prospective study that included participants referred to our institution for ventilation - perfusion (VQ) scans between August 2015 and July 2017. One hundred and twenty-nine subjects were randomized to either receive ^{99m}Tc -DTPA, MDP or MIBI radioaerosol as the ventilation agent. All the participants had normal chest x rays and debilitated participants were excluded from the study. The quality of images obtained from the different radioaerosols was visually assessed with the aid of a scoring system. The alveolar clearance was also assessed using a semi-quantitative method by tracing a region of interest (ROI) around the periphery of both lungs on early and late posterior images. The percentage of tracer lost during the time interval between the early and late images was then calculated. These were all done by a nuclear medicine physician blinded to the use of the different radioaerosols. Ethics approval was obtained from the University of Witwatersrand's Human Research Ethics Committee and signed informed consent was obtained from all study participants. **RESULTS** MIBI had higher count rates than DTPA and MDP, with a statistically significant difference when compared with DTPA (p=0.021). Alveolar clearance of the three radioaerosols was compared using ANOVA with Bonferroni correction. MIBI clearly showed slower alveolar clearance when compared with the clearance of DTPA (p= <0.0001) and MDP (p= < 0.001). In terms of image quality, none of the 129 participants had non-interpretable images or images with poor peripheral penetration.

MIBI generally had better quality images as compared to the other two radioaerosols, with a statistically significant difference when compared with DTPA ($p=0.001$; logistic regression). Fewer participants had bronchial/tracheal and stomach activity in the MIBI group when compared to the MDP and DTPA groups. **CONCLUSION** To our knowledge, this is the largest and the first randomized prospective study in this regard. We have shown that ^{99m}Tc MIBI and ^{99m}Tc MDP are very good substitutes for ^{99m}Tc DTPA for lung ventilation scintigraphy in patients being evaluated for suspected pulmonary thromboembolism. ^{99m}Tc MIBI demonstrated the best image quality and slowest alveolar clearance. Although not statistically significant in our study, ^{99m}Tc MDP also performed better than ^{99m}Tc DTPA. We therefore recommend that these agents can replace ^{99m}Tc DTPA whenever clinically and economically applicable..



Send and/or receive and personalise additional images of this article. MIBI always produces the best image quality and slowest alveolar clearance in our study.

[View larger version:](#)

[In this page](#) [In a new window](#)

[Download as PowerPoint Slide](#)

No Related Web Pages

We recommend

Comparison of technetium-99m pyrophosphate and technetium-99m DTPA aerosols for SPECT ventilation lung imaging.

A T Isitman et al., J Nucl Med

Ventilation-Perfusion SPECT with ^{99m}Tc -DTPA Versus Technegas: A Head-to-Head Study in Obstructive and Nonobstructive Disease

Jonas Jögi et al., J Nucl Med

^{99m}Tc Exogenous natural surfactant (^{99m}Tc -ENS) for pulmonary ventilation

Victoria Soroa et al., J Nucl Med

Impaired lung epithelial permeability in diabetics detected by technetium- 99m -DTPA aerosol scintigraphy.

B Caner et al., J Nucl Med

Should You Change Your Asthma Plan?

WebMD

14 Questions to See If You Should Change Your Asthma Action Plan.

WebMD

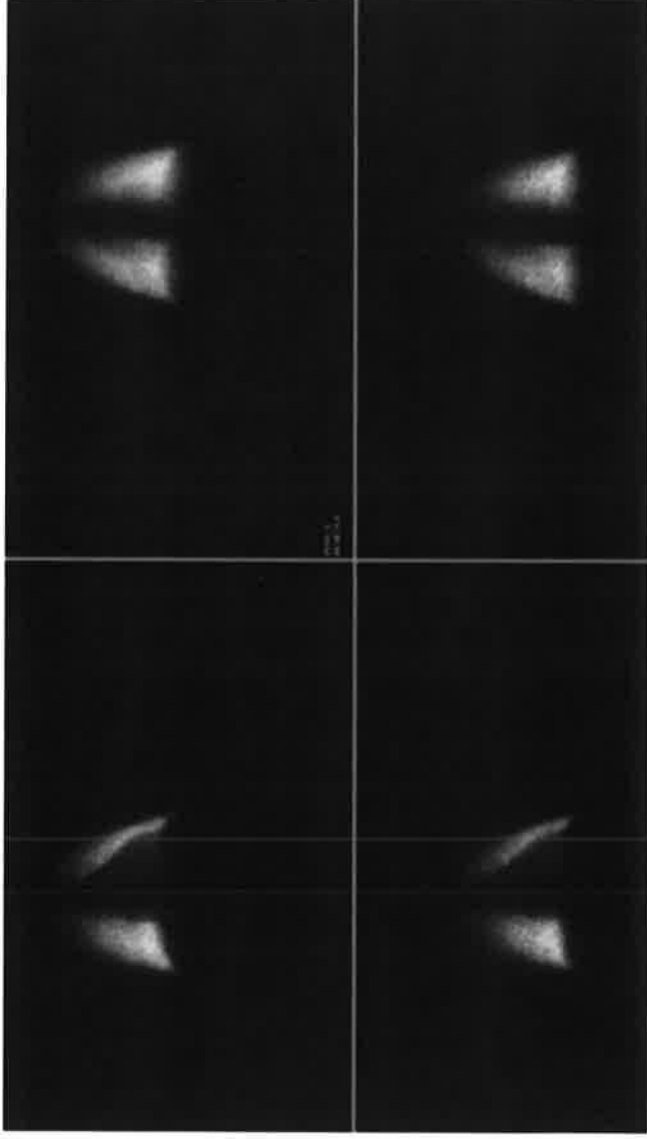
^{18}F -NaF PET/CT for Detecting Skeletal Metastases From Renal Cell Carcinoma

PracticeUpdate

Radiolabeled WBC Scintigraphy in the Diagnostic Workup of Patients With Suspected Device-Related Infections

PracticeUpdate

^{99m}Tc -MIBI SPECT/CT Differentiates Between Benign, Malignant Kidney Tumors



Initial and late anterior and posterior ventilation images of 99mTc MIBI showing uniform and peripheral distribution of tracer with no central or stomach deposition

Evbuomwan Osayande et al. J Nucl Med 2018;59:1616

