^{99m}Tc-Tetrofosmin Scintigraphy in Management of Pulmonary Tuberculosis

TO THE EDITOR: We read with interest the article by Degirmenci et al. (*1*) exploring the role of ^{99m}Tc-tetrofosmin scintigraphy in pulmonary tuberculosis. The authors reported that tetrofosmin uptake was grade + in 15% and grade ++ in 85% of patients with active pulmonary tuberculosis (i.e., sputum culture was positive). There was no uptake in 5 of the 6 patients with inactive pulmonary tuberculosis. The decrease or disappearance of tetrofosmin uptake in 5 out of the 6 patients with active disease who were followed up after 9 mo of therapy correlated well with the clinical and radiologic findings. The authors assumed inactive tuberculosis in patients with negative sputum smears and cultures. Certain patients who were not producing more than 10–100 bacilli per milliliter of sputum (sputum smear and culture negative) still may have had active disease.

Pulmonary tuberculosis is an infection that is still rampant in developing countries and is making a comeback in developed countries, with the advent of AIDS. No single, simple test can definitively diagnose pulmonary tuberculosis; diagnosis is generally based on the correlation of clinical, laboratory (i.e., erythrocyte sedimentation rate, Mantoux test, sputum smears, and sputum culture for acid-fast bacillus [AFB]), radiologic findings, and, in some cases, a therapeutic trial of antitubercular treatment. Among laboratory tests, sputum cultures have a high specificity but there must be at least 10–100 *Mycobacterium tuberculosis* organisms per milliliter of sputum for detection by the culture method (*2*). Its use as a gold standard in the diagnosis of active pulmonary tuberculosis is questionable, because not all the active cases of tuberculosis would be producing the sufficient number of organisms in the sputum. Problems commonly faced by clinicians treating tuberculosis are difficulty in distinguishing between active and healed lesions in suspected cases of recurrence and assessment of response to therapy in cases of multidrug resistance. Two related studies have been published in *The Journal of Nuclear Medicine* (*1,3*) that explored the role of radiopharmaceuticals in the above-mentioned problems.

We performed ^{99m}Tc-tetrofosmin scanning in 30 adult patients (17 men, 13 women). Of the 30 patients, 20 had suspected cases of tuberculosis and 10 were control subjects. Of the 20 patients we believed had tuberculosis, 13 were suspected to have had active tuberculosis on the basis of clinical, laboratory, and radiologic criteria with no history of any antitubercular therapy; 5 patients had previously undergone 6 mo of therapy with no symptoms of active disease; and 2 patients who previously completed full therapy presented with symptoms of active disease. We used 10 patients with coronary artery disease who had presented for cardiac analysis but had no evidence of tubercular disease as control subjects. After 20 min of injecting 370 MBq ^{99m}Tc-tetrofosmin, we obtained an anterior view using a low-energy, all-purpose collimator. A chest radiograph was obtained within 7 d of scintigraphy. The radiotracer uptake in 12 of 13 (92%) patients with suspected active tuberculosis showed a high degree of correlation with the radiographic findings. In 1 patient (8%), there was bilateral radiotracer uptake (false-positive), whereas the radiograph showed a lesion on 1 side only. Of the 5 treated patients, 4 did not show any radiotracer uptake and 1 had equivocal uptake. The chest radiographic findings in these treated patients were difficult to interpret definitively as healed or active lesions, and we were not able to differentiate between active lesion and tubercular sequelae in 2 patients with suspected relapse of active tubercular disease after full therapy 5 y before. Both these patients showed uptake on ^{99m}Tc-tetrofosmin scanning. Sputum cultures done subsequently showed positive results for AFB. All patients in the control group showed no radiotracer uptake.

We concluded that radiotracer uptake in active tuberculosis had a strong correlation with radiographic chest findings in untreated patients who had active tuberculosis. In cured cases of tuberculosis, there was no uptake of ^{99m}Tc-tetrofosmin. Radiotracer uptake can also be helpful in patients with recurrent symptoms for whom it is difficult to distinguish between active disease and tubercular sequelae.

Because sputum cultures normally take up to 2 mo for confirmation of disease, we believe that ^{99m}Tc-tetrofosmin scanning could be useful in distinguishing between active and healed lesions, which is not easily distinguished on chest radiographs. This may not be required in routine cases of pulmonary tuberculosis, as the 4-drug regimen generally used has a high cure rate. False-positive scans may result from pneumonitis in patients with suspected recurrence. This can be distinguished by a repeat scan after a 2-wk therapeutic trial of antibiotics. ^{99m}Tc-tetrofosmin scanning could have useful implications in the follow-up of patients who are on antitubercular therapy to determine the resolution of the active disease into healed lesions, particularly in the case of multidrug-resistant tuberculosis in which second-line drugs are commonly used. We propose to undertake a study of patients with active tuberculosis, in which the follow-up includes the response to therapy with serial scans at 3-mo intervals to see the changes on ^{99m}Tc-tetrofosmin scanning. This type of follow-up can be suggested in cases of multidrug-resistant tuberculosis for documenting disease control with therapy.

REFERENCES

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Left Ventricular Ejection Fraction and Gated SPECT

TO THE EDITOR: In the May 1999 issue of *The Journal of Nuclear Medicine*, the results of our study (*1*), which focused on