

R.J. Quinn  
S.P. Butler  
*The St. George Hospital  
Sydney, Australia*

## Fast Diagnosis of Abdominal Infections with Technetium-99m-HMPAO-Leukocytes

**TO THE EDITOR:** I have read with great interest the article by Lantto et al. published in the *Journal (JNM)* 1991;32:2029-2034). The labeling of leukocytes with  $^{99m}\text{Tc}$ -HMPAO has attracted considerable attention and acceptance in recent years because of its high sensitivity, specificity and convenient availability. Image resolution, rapid and accurate diagnosis, especially for inflammatory bowel disease, are now being made accurately within 1-2 hr postinjection.

Our ongoing studies with  $^{99m}\text{Tc}$ -HMPAO-labeled leukocytes correlate and readily support Lantto et al.'s observation that most abdominal infections are visualized at 1 hr postinjection. The cells were labeled by employing the modified Hammersmith protocol. This enables greatly increased labeling efficiency while reducing the volume of blood required for the procedure. Of the 32 patients studied, 25% showed RLQ activity at 1 hr, and 75% showed RLQ activity at 4 hr postinjection. The nonspecific activity primarily in the ascending colon precludes the usefulness of imaging for abdominal abscess at 4 and 24 hr.

At this institution,  $^{111}\text{In}$  is used to label WBCs for studies of the abdomen, and images are collected at 1 hr for evaluation of inflammatory bowel disease and at 4 and 24 hr to detect abscesses. In the event that  $^{111}\text{In}$ -oxine is not available, we label WBCs with  $^{99m}\text{Tc}$ -HMPAO and image for 1-2 hr only.

We have elected to continue to use  $^{111}\text{In}$ -oxine in order to avoid the chance of false-positive findings, until such time as its replacement by  $^{99m}\text{Tc}$ -HMPAO can be justified on the basis of availability or other factors.

## REFERENCES

1. Mountford PJ, Kettle AG, O'Doherty MJ, et al. Comparison of technetium-99m-HMPAO leukocytes with indium-111-oxine leukocytes for localizing intraabdominal sepsis. *J Nucl Med* 1990;31:311-15.
2. Karalasingam L, Ripley SD. Diagnostic significance of Tc-99m HMPAO

Logaraj Karalasingam  
*Metropolitan General Hospital  
Windsor, Canada*

**REPLY:** We would like to thank Dr. Karalasingam for his comments on our recent publication and are interested to know that he has observed that most infections are positive with  $^{99m}\text{Tc}$ -HMPAO-leukocytes within 1 hr after reinjection. We also agree that the nonspecific bowel activity in the right lower abdomen hinders the correct interpretation of scintigrams when patients are imaged only at 4 and 24 hr. Therefore, we routinely use serial imaging before 4 hr to avoid misinterpretations. The possible activity in the intestinal background at this point is rarely seen and easily distinguished from true inflammatory activity. The frequency of RLQ activity at 1 and 4 hr reported by Dr. Karalasingam is surprisingly high and disagrees with our experience and results (1). We suppose that this might be due to some differences in the labeling technique and patient population.

At our institution, a great number of patients are imaged for suspicion of an acute abdominal infection, for which the early results are important. Infections and inflammations are visualized much earlier with  $^{99m}\text{Tc}$ -HMPAO-leukocytes than with  $^{111}\text{In}$ -leukocytes due to the better imaging characteristics of  $^{99m}\text{Tc}$ , greater injection doses allowed by the lower radiation burden of  $^{99m}\text{Tc}$  and the presence of plasma during the labeling procedure. Furthermore, according to our results, the duration of symptoms does not lower the sensitivity of early images. Previously, Schmidt et al. (2) have also reported that the speed of granulocyte accumulation is not affected by the duration of infection. So we have found that late images (after 4 hr) are useless and thus avoid unnecessary false-positives.

## REFERENCES

1. Lantto EH, Lantto TJ, Vorne M. Fast diagnosis of abdominal infections and inflammations with  $^{99m}\text{Tc}$ -HMPAO-labeled leukocytes. *J Nucl Med* 1991;32:2029-2034.
2. Schmidt KG, Rasmussen JW, Wedebye IM, Frederiksen PB. Analysis of factors that may affect the speed of accumulation of  $^{111}\text{In}$ -labelled granulocytes at sites of inflammation. *Nucl Med Commun* 1988;9:87-103.

Eila Lantto  
Tuomo Lantto  
Martti Vorne  
*Päijät-Häme Central Hospital  
Lahti, Finland*