Radiolabeled Immunoglobulin Scintigraphy for the Diagnosis of Spondylodiscitis

TO THE EDITOR: Datz et al.'s article on the efficacy of 111In-polyclonal immunoglobulinG (IgG) to detect infection and inflammation (1) contains one case of spondylodiscitis in which scintigraphy with 111In-IgG yielded a positive result. Another five true-positive results have been obtained with this tracer in cases of spondylodiscitis caused by various organisms (2).

Labeled leukocytes have difficulty establishing the diagnosis of spondylitis/spondylodiscitis (3–5). Uptake of 67Ga is aspecific. Therefore, polyclonal IgG potentially could be useful for this diagnosis. However, since no other spinal diseases have been included in the above mentioned series, questions about the specificity of this method for the diagnosis of spondylodiscitis still need to be addressed.

Results obtained with 99mTc-IgG have been less encouraging. In one study using iminothiolane-derived IgG, three cases of spondylodiscitis were found false-negative with 99mTc-IgG (6). Another study using DTPA conjugated IgG, reported one false-negative and two true-positive results (7). Our own experience with 99mTc-IgG for the diagnosis of spondylodiscitis is summarized in Table 1. Images were obtained at approximately 5 and 24 hr after injection of 555 MBq 99mTc-IgG labeled via its iminothiolane derivative.

From these cumulative data, it would appear that 99mTc-IgG lacks sensitivity for the diagnosis of spondylodiscitis, perhaps unlike its 111In-labeled counterpart. Differences between the biodistribution of 111In- and 99mTc-IgG have also been observed in animal models of focal infection (8). Technetium-IgG radiolabeled via the hydrazino nicotinamide derivative is known from animal studies to behave more like 111In-IgG (9).

In conclusion, although radiolabeled IgG may hold promise for the diagnosis of infectious spondylitis, further studies in more extensive patient groups are required to define its specificity and sensitivity in this respect, as well as the radiolabel and radiolabeling method of choice.

REFERENCES


Frank De Geeter
Saint John's General Hospital Brugge, Belgium

REPLY: There are a number of problems with using radionuclide infection imaging agents for diagnosing osteomyelitis/discitis of the spine, especially in postoperative patients. Indium-111-leucocytes detect most musculoskeletal infections with reported sensitivities ranging from 83% to 100%. Several recent studies, however, have shown that 111In-leucocytes are less sensitive for spine infections. In 22 patients with biopsy proven osteomyelitis/discitis, Whalen et al. found that the leucocyte scan had a sensitivity of only 13% (2). Palestro et al. studied 71 patients with suspected vertebral osteomyelitis and found only 39% had increased activity. A total of 7% had normal studies and 54% had photopenic defects (3). Unfortunately, photopenia on leucocyte scans is not specific for osteomyelitis. Cold defects have been described in tumor, radiation, fracture, Paget's disease, degenerative arthritis and following surgery (4).

It is unclear why labeled leucocytes do not detect vertebral infections as well as other musculoskeletal infections. A pathophysiologic explanation has been offered by Palestro (5). Vertebral osteomyelitis likely originates as a septic embolism that lodges in a metaphyseal artery. Retrograde propagation into the metaphyseal anastomosis circumferentially around the vertebral body may involve other metaphyseal arteries, with the development of sequential septic infarcts. Occlusion of such a large number of vessels may impede white cell migration to the site of infection. Lower sensitivity in spine infections may be partially explained by the difficulty in detecting cold defects compared to hot lesions. The timing of the scan may also be important. At the