

Diagnostic accuracy of commonly performed radionuclide methods for diabetic foot osteomyelitis: a retrospective study in 115 pedal sites

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**Introduction-Aim:** At the present time, the standard radionuclide approach to diabetic patients (pts) with foot infections is bone scan followed by labeled leucocyte scan. However, the optimal diagnostic approach remains unclear. The aim of the study was to evaluate the diagnostic accuracy of three phase <sup>99m</sup>Tc-MDP-bone scan (BS) and <sup>99m</sup>Tc-HMPAO-labeled leucocyte scan (LS), alone and in combination with BS, for the diagnosis of pedal OM in diabetics. **Patients and methods:** We retrospectively analysed BS and LS performed in 100 diabetic pts with clinical suspicion of OM in 115 pedal sites. Ninety-two pts had 101 pedal ulcers and 45 pts had Charcot arthropathy (CA). Focal arterial hyperperfusion, hyperemia and increased bone uptake on BS was considered compatible with OM. LS images alone were classified as positive for OM when focally increased bone uptake at the site of suspected infection was greater than surrounding soft tissue uptake or in cases of focally increased leucocyte uptake of the same intensity on both dorsal and plantar views. When LS were interpreted together with BS, spatially congruent BS/LS findings were considered positive for OM. Final diagnosis was based on clinical and radiological follow-up or bone biopsy. **Results:** Among the 115 pedal sites investigated, 49 foci of OM, 10 cases with acute CA and 56 sites with simple soft tissue infection were finally diagnosed. BS was sensitive (97.9%), but not specific (37.0%) in the diagnosis of diabetic foot OM. Positive (PPV), negative predictive value (NPV) and accuracy of BS were 58.0%, 95.2% and 65.7%, respectively. Sensitivity, specificity, PPV, NPV and accuracy of LS alone were high: 93.7%, 96.5%, 93.7%, 96.5% and 95.5% respectively. The addition of BS resulted in only marginal improvement of specificity of LS (from 96.5% to 97.8%). Sensitivity, specificity, PPV, NPV and accuracy of combined LS/BS were 90.0%, 97.8%, 96.4%, 93.7% and 94.7% respectively. **Conclusion:** Bone scan is usually not useful in the diagnosis of diabetic foot OM. Conversely, with an accuracy of 95.5%, <sup>99m</sup>Tc-HMPAO-LS is the most effective radionuclide test for diagnosing diabetic foot OM. Accuracy of LS is not affected by whether or not the pts have bone scan. Consequently we recommend that the radionuclide approach to pts with diabetic foot infections should be changed and <sup>99m</sup>Tc-HMPAO-LS should be the first, and in most cases the single, radionuclide imaging performed in clinical suspicion of OM in the diabetic foot.