

[O04] VALUE OF SPECT/CT IN THE DIAGNOSIS OF DIABETIC FOOT OSTEOMYELITIS BY ^{99m}Tc-HMPAO-LABELED LEUCOCYTE SCAN

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Background and aim: Scintigraphy with in vitro labeled leucocytes is a well established method for diagnosing diabetic foot osteomyelitis (DFO). However, poor spatial resolution and lack of anatomic landmarks often limit the ability of labeled leucocyte scan to discriminate bone from soft tissue infection, especially in areas with small bone structures as in the foot. The aim of the study was to evaluate the contribution of SPECT/CT as an adjunct to planar images of ^{99m}Tc-HMPAO-labeled leucocyte scan (LS) for diagnosing and localizing infection in the diabetic foot.

Patients and methods: Fifty consecutive patients with clinical suspicion of DFO were included in the study. Totally 64 pedal sites suspected for DFO were investigated by ^{99m}Tc-HMPAO-labeled leucocyte scan. Planar images were acquired 1 and 4 hours post injection of in vitro labeled autologous leucocytes followed by a SPECT/CT scan at the end of the study. LS images were interpreted alone and in conjunction with SPECT/CT scans and were considered to be positive for DFO when focally increased leucocyte bone uptake was observed. Final diagnosis was based on clinical and radiological follow-up or bone biopsy.

Results: Among the 64 pedal sites investigated, 24 cases of DFO, 5 cases with acute Charcot arthropathy without osteomyelitis, 31 sites with simple soft tissue infection (STI) and 4 sites negative for active infection were finally diagnosed. LS planar images showed increased leucocyte accumulation compatible with active -bone and/or soft tissue- infection in 60 of 64 sites, and were negative for active infection in 4 of 64 sites. In patients with positive scans, the addition of SPECT/CT correctly localized infection to bone in 23 of 24 sites with DFO and to soft tissues in 30 of 31 sites with STI, changing the interpretation of planar images in 12 of 60 patients with positive scans and providing additional anatomical information and precise definition of the extend of infection in 33 more patients with positive scans. Conversely, the addition of SPECT/CT did not alter the evaluation of patients with negative LS planar scans. Sensitivity, specificity, accuracy, positive and negative predictive value of LS planar images for diagnosing DFO were 82.6%, 78 %, 79.7 %, 67.9% and 88.9% respectively. All values were improved with the addition of SPECT/CT to 100%, 95.1%, 96.9%, 92% and 100%, respectively.

Conclusion: SPECT/CT improves the diagnostic performance of ^{99m}Tc-HMPAO-labelled leucocyte scan for DFO. The additional performance of SPECT/CT increased the diagnostic accuracy of LS for DFO from 79.7% to 96.9% by enhancing both sensitivity and specificity of the study. The CT component of SPECT/CT provides accurate anatomical localization of increased leucocyte uptake, enabling discrimination of bone from soft tissue infection and better definition of the extent of infection.