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Diabetic foot osteomyelitis: monitoring response to antibiotic treatment by labelled leucocyte scintigraphy

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Introduction-Aim: Confirmation of cure of diabetic foot osteomyelitis (OM) and determination of the correct time for medical treatment discontinuation is often difficult. An imaging method reliable to prove the cure or the persistence of OM should be useful in clinical practice. Radiography, MRI and bone scan are not helpful in assessing response to therapy as they remain positive for many months even after successful therapy. In our study, we evaluate the efficacy of ^{99m}Tc-HMPAO-labelled leucocyte scan (HMPAO-LS) for monitoring response to antibiotic treatment in patients with diabetic foot OM. **Patients and methods:** Twenty five diabetic patients (12 men, aged 61.3 $\pm$ 8.3 years) with radiographic evidence of pedal OM were enrolled in the study. All patients were on antibiotic treatment (mean treatment duration 3.9 $\pm$ 3.4 months) and all had abnormal findings on three phase bone scan. HMPAO-LS of the feet were performed in all patients. Focal leucocyte accumulation was considered as sign of persistent OM. Leucocyte scan was considered negative for OM when no pedal leucocyte accumulation was observed or when there was abnormal leucocyte uptake disconcordant with the focus of increased uptake on bone scan (soft tissue infection). Final evaluation was based on a long term clinical follow-up or bone biopsy in patients eventually underwent amputation. **Results:** HMPAO-LS showed no pedal accumulation in 20/25 patients. Focal leucocyte accumulation, compatible with persistent OM, was observed in 5 patients. HMPAO-LS results were as follows: TN 19, TP 5, FN 1, FP 0. In a patient with persistent OM, confirmed by histopathological examination of bone specimen, HMPAO-LS falsely suggested that the infection was confined to the overlying pedal ulcer. This false negative result may be due to reduced inflow of circulating leucocytes to the focus of chronic OM. Sensitivity, specificity and accuracy of HMPAO-LS for diagnosing active OM in patients receiving antibiotic therapy were 83,3 %, 100 % and 96 % respectively. The positive and negative predictive value of HMPAO-LS were 100 % and 95 % respectively. **Conclusion:** With an accuracy of 96%, HMPAO-LS is the most useful imaging modality for monitoring response to medical therapy in cases of diabetic foot OM. Pathological findings on leucocyte scan revert to normal quickly after successful treatment, so a negative study could be useful as a guide to discontinue antibiotic treatment.