

**A Bone Scan Score to predict early Charcot arthropathy**

Riddhika Chakravartty<sup>1</sup>, Nina Petrova<sup>2</sup>, Eleni Kalogianni<sup>1</sup>, Ron Mistry<sup>1</sup>, Claire Hooker<sup>1</sup>, Benjamin Corcoran<sup>1</sup>, Nicola Mulholland<sup>1</sup>, Gill Vivian<sup>1</sup> and Michael Edmonds<sup>2</sup>

<sup>1</sup>Nuclear Medicine Department <sup>2</sup> Diabetic Foot Clinic Kings College Hospital NHS trust, London, U.K.

**Aim:** To assess correlation between a novel quantitative score derived from Triple Phase Bone Scintigraphy and clinical parameters in order to effectively diagnose the presence of Early Charcot Arthropathy. **Patients and Methods:** Adult patients attending the diabetic foot clinic with neuropathy but without foot ulceration or vasculopathy with unilateral clinical findings indicating a diagnosis of early Charcot arthropathy were referred for Triple Phase <sup>99m</sup>Tc MDP Bone Scans with SPECT/CT. Clinical indices of suspicion were calculated for each foot separately scoring a single point each for increased temperature, redness, oedema and a history of trauma. In addition, for each foot, skin temperature was recorded at the lateral and medial malleoli, dorsum, plantar and ankle. The difference in temperature between feet was calculated; a difference of >2°C was considered significant. Similarly a bone scan score was calculated by scoring positive findings on each of the blood flow, blood pooling and delayed uptake phases with 0,1 and 2 indicating normal, mildly increased and significantly increased uptake respectively. SPECT/CT was used to further localise regions affected. Statistical analysis was carried out using SPSS version 17. The scores were also correlated with the clinical treatment decisions. **Results:** Both feet of 20 patients (13 men, 7 women, median age 58 years) were assessed. The bone scan scores for each foot showed a moderate correlation with clinical index of suspicion ( $r = 0.643$ ,  $p < 0.05$ ). While there was no correlation between the bone scan score and the greatest overall skin temperature, scores for the clinically suspicious foot correlated moderately with the absolute temperature difference ( $r = 0.488$ ,  $p < 0.05$ ). SPECT/CT findings correlated well with the region of the foot deemed affected as well as with the decision to retain the foot in a boot. **Conclusion:** The Bone Scan Score is a simple tool to effectively validate clinical impressions of early Charcot arthropathy.

