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^{99m}Tc(V)-DMSA scintigraphy in monitoring the response of bone disease to vitamin D_3 therapy in renal osteodystrophy

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Renal osteodystrophy (ROD) is a common and serious complication for uremic patients and patients are treated with 1,25-dihydroxyvitamin D_3. The bone scanning agent ^{99m}Tc-phosphate has also been used to evaluate in ROD but it is not clear that bone scintigraphy has a role in the follow-up of treatment. In this study ^{99m}Tc(V)-DMSA scintigraphy was performed in eleven patients [age 40.7 ± 17.3 (mean ± SD) yr] with ROD before and after vitamin D_3 therapy. Images were obtained after hemodialysis performed following tracer injection to maintain normal blood levels of the radiopharmaceutical and to reduce soft tissue activity. Lumbar vertebra-to-soft tissue uptake ratios (LUR) were quantified with the planar ^{99m}Tc(V)-DMSA images. Alkaline phosphatase and parathyroid hormone levels after treatment had significantly decreased compared with pre-therapy. In all patients there was visually decreased uptake in bone structures after treatment. After treatment the mean LUR ratio was significantly lower than those of before treatment (3.59 ± 2.63 vs. 1.65 ± 0.62; $p = 0.01$). LUR values were correlated with pre-therapy alkaline phosphatase and parathyroid hormone. These findings indicate that ^{99m}Tc(V)-DMSA scintigraphy is sensitive in evaluating the response of ROD to vitamin D_3 therapy.

Key words: renal osteodystrophy, scintigraphy, ^{99m}Tc(V)-DMSA