First Experience With SPECT/CT Using a 99mTc-Labeled Inhibitor for Prostate-Specific Membrane Antigen in Patients With Biochemical Recurrence of Prostate Cancer.


Abstract

AIM: Prostate-specific membrane antigen (PSMA) is overexpressed in most prostate cancers (PCs). Here, we report our first experience using the Tc-labeled PSMA inhibitor MIP-1404 (Progenics Pharmaceuticals, Inc, Tarrytown, NY) in 60 patients with biochemically recurrent PC.

METHODS: Whole-body planar scintigraphy and SPECT/CT of the lower abdominal pelvic region of 60 patients with biochemical relapse of PC were analyzed retrospectively. In these subjects, an average dose of 733.1 ± 49.5 MBq (19.8 ± 1.3 mCi) Tc-labeled MIP-1404 was injected 4 to 5 hours prior to imaging. In addition to visual evaluation, SUVmax were determined in the tumor lesions using a previously developed protocol for quantitative SPECT/CT.

RESULTS: In 42 of 60 patients, Tc-MIP-1404-positive lesions could be detected (70%; 95% confidence interval [CI], 0.58-0.82). Twenty patients had Tc-MIP-1404-positive lymph nodes suggestive of metastasis, 14 patients had pathological uptake in the prostate region indicative of local recurrence, and for another 19 patients, there was tracer accumulation in the skeleton (n = 18) or lungs (n = 1). Detection rate was 91.4% (95% CI, 0.82-1) at prostate-specific antigen levels greater than 2 ng/mL and 40.0% (95% CI, 0.21-0.59) at lower prostate-specific antigen values (P < 0.01). Of the 60 patients, in total, 82 positive lesions were analyzed quantitatively. Average SUVmax of the lesions was 16.3 ± 21.6 with a range of 1.7 to 142.9.

CONCLUSION: Tc-labeled PSMA inhibitor MIP-1404 is a promising SPECT tracer for detection of locally recurrent or metastatic prostate cancer.

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