Detection of Bone Metastases Using 11C-Acetate PET in Patients with Prostate Cancer with Biochemical Recurrence.


Abstract

To evaluate the diagnostic accuracy of (11)C-acetate positron-emission tomography (PET) in the detection of bone metastasis in patients with prostate cancer with biochemical recurrence.

PATIENTS AND METHODS: Ninety patients (100%) with rising prostate-specific antigen (PSA) levels (>0.2 ng/ml) after radical prostatectomy, who had both (11)C-acetate PET and bone scan performed and who had clinical follow-up/imaging follow-up for bone metastasis, considered a gold standard, were included. Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) for (11)C-acetate PET were calculated on a per-patient basis.

RESULTS: (11)C-Acetate PET and (99m)Tc-dicarboxypropane-diphosphonate findings were concordant in 84 (93.3%) patients [35 (38.9%) true-positive, 49 (54.4%) true-negative]. Discordant findings were observed in six patients (6.7%). (11)C-Acetate PET presented two (2.2%) false-positive and four (4.4%) false-negative findings. The sensitivity, specificity, PPV, and NPV for (11)C-acetate PET were 89.7%, 96.1%, 94.6%, and 92.2%, respectively. The median PSA of patients with multiple skeletal metastases (median=23.64 ng/ml, range=3.16-551.1 ng/ml) differed significantly (p=0.018) from that of patients with focal metastases (median=6.7 ng/ml, range=0.31-12.8 ng/ml).

CONCLUSION: (11)C-Acetate PET is a useful tool for patients with prostate cancer with biochemical recurrence, as it can depict multiple sites of recurrence and in particularly shows a high diagnostic value equivalent to that of bone scan for the detection of bone metastases.

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KEYWORDS: Bone metastases; PET; acetate; prostate cancer

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