

Comparison of ^{11}C -Choline and ^{11}C -Methionine-PET/CT in Multiple Myeloma

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Ziel/Aim:

Positron emission tomography/computed tomography (PET/CT) with both ^{11}C -choline and ^{11}C -methionine has recently been reported to offer advantages over ^{18}F -2'-deoxy-2'-fluorodeoxyglucose (FDG) for staging and re-staging in multiple myeloma (MM). The aim of this study was to directly compare the diagnostic performance of both non-FDG radiotracers in MM patients.

Methodik/Methods:

Nineteen patients with a history of MM (n = 18) or solitary bone plasmacytoma (n = 1) underwent both ^{11}C -choline- and ^{11}C -methionine-PET/CT for re-staging within 10 days (median, 1 day). Scans were compared on a patient and on a lesion basis including number and location of focal lesions as well as presence of extramedullary disease. In 12 patients, respective tracer uptake in the iliac crest was correlated with the extent of malignant bone marrow (BM) plasma cell infiltration.

Ergebnisse/Results:

In comparison to ^{11}C -choline, ^{11}C -methionine detected more intramedullary MM lesions in 8/19 (42.1%) patients. In the remainder (11/19; 57.9%), both ^{11}C -choline and ^{11}C -methionine provided equal results. ^{11}C -methionine demonstrated higher lesion-to-blood pool and higher lesion-to-muscle ratios ($p < 0.05$). In the 12 patients, in whom a recent BM biopsy was available, both tracers correlated significantly with malignant plasma cell involvement ($p < 0.01$), with ^{11}C -methionine displaying a stronger correlation (SUV_{mean} : $R^2 = 0.72$ versus $R^2 = 0.52$; SUV_{max} : $R^2 = 0.67$ versus $R^2 = 0.54$; $p < 0.05$, respectively).

Schlussfolgerungen/Conclusions:

Our data suggest that ^{11}C -methionine-PET/CT is more sensitive and accurate than ^{11}C -choline-PET/CT for the detection of active MM lesions.