Dokumenttyp: journal article

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Abstract: R-CHOP (rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone)-like chemotherapy is the standard therapy in aggressive B-cell lymphoma. (18)F-FDG PET has high prognostic implications at treatment completion but is limited as an early predictor. Here, we present the results of a prospective study correlating the initial uptake of the in vivo proliferation marker 3'-deoxy-3'-(18)F-fluorothymidine (18)F-FLT with the clinical outcome of patients with aggressive non-Hodgkin lymphoma treated with R-CHOP. Sixty-six eligible patients were evaluated prospectively with (18)F-FLT PET before R-CHOP. PET was performed 45 min after injection of 300-370 MBq of (18)F-FLT. Mean and maximum standardized uptake values (SUVs) were calculated on a lesion-by-lesion basis. Response was assessed at the end of therapy. International Prognostic Index (IPI) scores and clinical parameters (Ann Arbor stage, lactate dehydrogenase, performance status, extranodal disease) were determined in all patients. Response was assessed according to revised response criteria after the end of therapy. After treatment, patients were followed in intervals from 4 wk to 6 mo (mean follow-up, 23.1 mo [range, 1-63 mo]), and progression-free and overall
survival were determined. All lymphoma lesions identified by a reference method ((18)F-FDG PET/CT or multislice CT of the trunk) showed increased focal tracer uptake (mean (18)F-FLT SUV, 7.3 ± 2.5). Response assessment revealed progressive disease in 4, partial response in 3, and complete response (CR) in the remaining 55 patients. The IPI score was predictive for achieving CR (P = 0.034). Importantly, initial mean SUV was also significantly higher in patients who showed progressive disease and partial response than in patients who achieved CR (P = 0.049). In addition, we found a significant correlation between IPI score and initial (18)F-FLT uptake. Taken together, high (18)F-FLT uptake is a negative predictor of response to R-CHOP treatment in aggressive B-cell non-Hodgkin lymphoma and correlates with the IPI score. Thus, (18)F-FLT PET may represent a useful tool for implementing risk-adapted treatment in these patients.

Zeitschriftentitel / Abkürzung:
J Nucl Med

Jahr:
2011

Band:
52

Heft / Issue:
5

Seiten:
690-6

Sprache:
eng

Pubmed:

Print-ISSN:
0161-5505

TUM Einrichtung:
Nuklearmedizinische Klinik und Poliklinik; r Medizinische Statistik und Epidemiologie; III. Medizinische Klinik und Poliklinik; r Allgemeine Pathologie und pathologische Anatomie

Occurences:
- Einrichtungen > Fakultäten > Fakultät für Medizin > Kliniken und Institute > III. Medizinische Klinik und Poliklinik (Hämatoologie / Onkologie) > 2011
- Einrichtungen > Fakultäten > Fakultät für Medizin > Kliniken und Institute > Institut für Medizinische Statistik und Epidemiologie > 2011
- Einrichtungen > Fakultäten > Fakultät für Medizin > Kliniken und Institute > Institut für Allgemeine Pathologie und Pathologische Anatomie > 2011
- Einrichtungen > Fakultäten > Fakultät für Medizin > Kliniken und Institute > Nuklearmedizinische Klinik und Poliklinik > 2011

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