Impact of Maximum Standardized Uptake Value (SUVmax) Evaluated by 18-Fluoro-2-deoxy-D-glucose Positron Emission Tomography / Computed Tomography (18F-FDG-PET/CT) on Survival for Patients with Advanced Renal Cell Carcinoma

Introduction and Objective: In this era of molecular targeting therapy when various systematic treatments can be selected, prognostic biomarkers are required for the purpose of risk-directed therapy selection. Numerous reports of various malignancies have revealed that 18-Fluoro-2-deoxy-D-glucose (^{18}F-FDG) accumulation, as evaluated by positron emission tomography, can be used to predict the prognosis of patients. The purpose of this study was to evaluate the impact of the maximum standardized uptake value (SUVmax) from 18-fluoro-2-deoxy-D-glucose positron emission tomography/computed tomography (^{18}F-FDG PET/CT) on survival for patients with advanced renal cell carcinoma (RCC).
Materials and Methods: A total of 67 patients with advanced or metastatic RCC were enrolled in this study. The FDG uptake of all RCC lesions diagnosed by conventional CT was evaluated by ^{18}F-FDG PET/CT. The impact of SUVmax on patient survival was analyzed prospectively.
Results: The mean duration of observation was 461 days (range, 7-1229 days). The SUVmax before treatment of 67 patients ranged between undetectable level and 16.6 (mean 7.6±3.6). The patients with RCC showing high SUVmax before treatment demonstrated poor prognosis (P<0.001 hazard ratio 1.289, 95% CI 1.161-1.430). The median survival time of 36 patients with RCC showing SUVmax less than 7.0 was 1229±991 days, that of 21 patients with RCC showing SUVmax between 7.0 and 12.0 was 446±202 days, and that of 10 patients RCC showing SUVmax higher than 12.0 was 95±43 days (<7.0 vs. 7.0< <12.0 P=0.0052, 7.0< <12.0 vs. 12.0<:P=0.0169, log-rank test). SUVmax demonstrated a tendency to predict the survival compared with the Memorial Sloan-Kettering Cancer Center classification (P =0.015 vs 0.315, multivariate Cox analyses).
Conclusions: The survival of patients with advanced RCC can be predicted by evaluating their SUVmax using ^{18}F-FDG-PET/CT. ^{18}F-FDG-PET/CT has potency as an “imaging biomarker” to provide helpful information for the clinical decision-making.