The Relationship Between 11C-acetate Uptake and the Expression of Fatty Acid Synthase in Renal Cell Carcinoma: A Preliminary Clinical Study

Introduction and Objective: Fatty acid synthase (FASN) is known as one of the important enzymes for lipid metabolism of acetate. In this clinical study, we investigated the relationship between FASN expression and ^{11}C-acetate (AC) uptake into renal cell carcinoma (RCC).
Materials and Methods: A total of 13 patients with histologically diagnosed renal cell carcinoma were enrolled in this study. All patients underwent AC PET scan, followed by nephrectomy or partial nephrectomy. Regional values of tracer uptake were evaluated by using standardized uptake value (SUV), a normalized value corrected by using injection dose and body weight. After surgery, the FASN expression in the resected tumor tissues were evaluated using RT-PCR method.
Results: In total 13 renal tumors were evaluated. AC PET findings were positive in 12 of these 13 RCCs (92%). There was a positive correlation observed between SUV and FASN expression in the tumors. The size of the tumor which showed negative AC PET scan was less than 1 cm, while the size of the tumor which showed positive AC PET was more than 2 cm.
Conclusions: AC PET demonstrated a pronounced increase in tracer uptake in RCC if the tumor is more than 2 cm. The possible correlation between AC uptake and FASN expression was suggested.