Abstract:

PURPOSE: The value and limitations of (11)C-choline PET and PET/CT for the detection of prostate cancer remain controversial. The aim of this study was to investigate the diagnostic efficacy of (11)C-choline PET and PET/CT in a large group of patients with suspected prostate cancer.

METHODS: Fifty-eight patients with clinical suspicion of prostate cancer underwent (11)C-choline PET (25/58, Siemens ECAT Exact HR+) or PET/CT (33/58, Philips Gemini) scanning. On average, 500 MBq of (11)C-choline was administered intravenously. Studies were interpreted by raters blinded to clinical information and other diagnostic procedures. Qualitative image analysis as well as semiquantitative SUV measurement was carried out. The reference standard was histopathological examination of resection specimens or biopsy.

RESULTS: Prevalence of prostate cancer in this selected patient population was 63.8% (37/58). (11)C-choline PET and PET/CT showed a sensitivity of 86.5% (32/37) and a specificity of 61.9% (13/21) in the detection of the primary malignancy. With regard to metastatic spread, PET showed a per-patient sensitivity of 81.8% (9/11) and produced no false positive findings.

CONCLUSION: Based on our findings, differentiation between benign prostatic changes, such as benign prostatic hyperplasia or
prostatitis, and prostate cancer is feasible in the majority of cases when image interpretation is primarily based on qualitative characteristics. SUV(max) may serve as guidance. False positive findings may occur due to an overlap of (11)C-choline uptake between benign and malignant processes. By providing functional information regarding both the primary malignancy and its metastases, (11)C-choline PET may prove to be a useful method for staging prostate cancer.

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