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Clinical management of PSMA-diagnostics in prostate carcinoma-importance of hybrid imaging using 68Ga-PSMA-PET/CT

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Background: Prostate cancer (PCa) is the second most common cancer in men worldwide. Several retrospective studies indicate that 68Ga-PSMA-PET/CT shows a superior detection capability compared with standard-of-care imaging, for detection of recurrent PCa and metastases. We evaluated the efficiency of this method to detect primary PCa with clinically relevant aggressive potential for guiding biopsy as well as surgery or radiotherapy.

Methods: Twenty-five patients with suspected PCa, based on an increased PSA level, were included in our study. Full-body scans were conducted 60 minutes after 68Ga-PSMA-11 injection. The radioligands' uptake was quantified as maximum standardized uptake value (SUVmax). A prostate biopsy was performed in all patients. The results of PET/CT scans were compared with the histopathological results of the biopsy (defined as Gleason Score, GS).

Results: In 21 of 25 patients (84%), 68Ga-PSMA-11 PET/CT detected prostatic lesions suspected of being malignant (using a cut off-level of SUVmax>2.5). PCa with a GS≥6 (low-grade and high-grade carcinoma) was confirmed by biopsy in all 21 cases. All high-grade PCa lesions (defined by GS≥7b as high-grade and ≤7a as low-grade cancer) showed a SUVmax>12.0, which continued to increase with rising GS. The optimal cut off-level to distinguish GS≤7a versus GS≥7b was determined by ROC analysis. A SUVmax of 5.4 was the optimal cut off-value (AUC=0.9692; 95% CI 0.9086; 1.000000; SD(AUC)=0.0309). Choosing this value, 68Ga-PSMA-11 PET/CT was able to distinguish between low- and high-grade PCa with a sensitivity of 84%, a specificity of 100%, a negative predictive value (NPV) of 67%, and an efficiency of 88% (p<0.001).

Conclusion: 68Ga-PSMA-11 PET/CT is a valuable imaging modality for the detection of primary PCa with a high efficiency for identifying clinically relevant aggressive cancer lesions and could help guiding biopsy and influence treatment decisions e.g. surgery or radiotherapy. Agus Trianto, Ocky Karna Radjasa, Rudhi Pribadi, Sekar Widyaningsih, Khoeruddin Wittriansyah, Isei Yusidharta, Wiratno, and Ita Riniatsih (2017) Exploration of Marine Sponges-Associated Fungi Producing Antifungal Compounds. Asian Journal of Microbiology Biotechnology & Environmental Science 19(3):588-593.

Biography

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