Format: Abstract

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Risk stratification and staging in prostate cancer with prostatic specific membrane antigen PET/CTObjective: A one-stop-shop.

Gupta M[1], Choudhury PS, Rawal S, Goel HC, Singh A, Talwar V, Sahoo SK.

1 Department of Nuclear Medicine, Rajiv Gandhi Cancer Institute and Research Centre, Sector-5, Rohini, Delhi, (110085), India. docmanojgupta@yahoo.com.

OBJECTIVE: Current imaging modalities for prostate cancer (PC) had limitations for risk stratification and staging. Magnetic resonance imaging (MRI) frequently underestimated lymphatic metastasis while bone scintigraphy often had diagnostic dilemmas. Prostatic specific membrane antigen (PSMA) positron emission tomography-computed tomography (PET/CT) has been remarkable in diagnosing PC recurrence and staging. We hypothesized it can become one-stop-shop for initial risk stratification and staging.

SUBJECTS AND METHOD: Ninety seven PSMA PET-CT studies were re analysed for tumor node metastases (TNM) staging and risk stratification of lymphatic and distant metastases proportion. The histopathology of 23/97 patients was available as gold standard. Chi-square test was used for proportion comparison. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), over-estimation, under-estimation and correct-estimation of T and N stages were calculated. Cohen's kappa coefficient (k) was derived for inter-rater agreement.

RESULTS: Lymphic or distant metastases detection on PSMA PET/CT increased significantly with increase in risk category. PSMA PET/CT sensitivity, specificity, PPV and NPV for extra prostatic extension (EPE), seminal vesicle invasion (SVI) and lymphatic metastases were 63.16%, 100%, 100%, 36.36% & 55%, 100%, 100%, 25% and 65.62%, 99.31%, 87.50%, 97.53%, respectively. Cohen's kappa coefficient showed substantial agreement between PSMA PET/CT and histopathological lymphic metastases (κ 0.734) however, it was just in fair agreement (κ 0.277) with T stage. PSMA PET/CT over-estimated, under-estimated and correct-estimated T and N stages in 8.71%, 39.13%, 52.17% and 8.71%, 4.35%, 86.96% cases, respectively.

CONCLUSION: We found that PSMA PET/CT has potential for initial risk stratifications with reasonable correct estimation for N stage. However, it can underestimate T stage. Hence, we suggest that PSMA PET/CT should be used for staging and initial risk stratification of PC as one-stop-shop with regional MRI in surgically resectable cases.

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