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PSMA uptake on [68Ga]-PSMA-11-PET/CT positively corrects with prostate cancer aggressiveness.

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BACKGROUND: Conflict results has been revealed on the relationship between PSMA uptake values (SUVs) on PSMA PET/CT and prostate cancer aggressiveness. This study is to validate the relationship between SUVs with prostate cancer (PCa) aggressiveness and its role in evaluation of clinically significant PCa (csPCa) and risk stratification.

METHODS: We retrospectively enrolled 51 patients who underwent [68Ga]-PSMA PET/CT (PET/CT) before radical prostatectomy (RP). PET/CT results were corrected with whole mount histology. The relationship between SUVs and aggressiveness related indictors including Gleason score, T stage, initial PSA and tumor size were analyzed. The cutoff value for detection of overall PCa, csPCa and intermediate/high-risk PCa were calculated by receiver operating characteristics (ROC) analysis.

RESULTS: Both SUVmax and SUVmean positively correlated with Gleason score (SUVmax Spearman r=0.546 p<0.01, SUVmean Spearman r=0.359 p<0.01), PSA level (SUVmax Spearman r=0.568 p<0.01, SUVmean Spearman r=0.529 p<0.01) and tumor volume (SUVmax Spearman r=0.635 p<0.01, SUVmean Spearman r=0.590 p<0.01). Tumors with T3 stage had significant higher SUV uptake than T2 (SUVmax 17.49 ± 10.50 vs 9.90 ± 8.7, p<0.01 and SUVmean 17.49 ± 10.50 vs 9.90 ± 8.7, p<0.01). ROC analysis showed cutoff of SUVmax (3.8) and SUVmean (2.8) for overall PCa detection. ROC analysis showed that csPCa and intermediate/high risk PCa had the same cutoff on both SUVmax (8.4) and SUVmean (6.8).

CONCLUSIONS: PSMA uptake on PSMA PET/CT positively correlated with Gleason score, T stage, initial PSA and tumor volume. Both SUVmax and SUVmean can be applied as parameters for csPCa detection and risk classification.

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