EP010 Standardized uptake values are adequate measures of [18F]DCFPyL PSMA PET/CT uptake in patients with low prostate cancer disease burden

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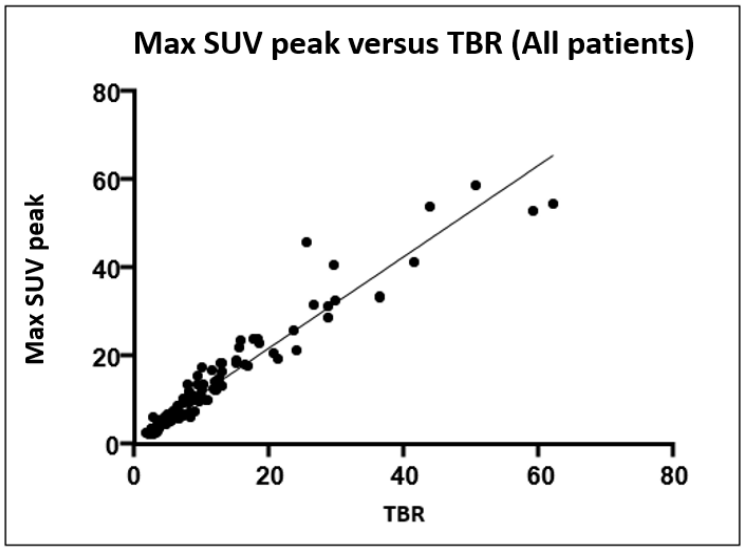
Introduction & Objectives: In prostate cancer (PCa) patients, the Tumor-to-Blood ratio (TBR) has been validated as the preferred simplified metric for lesional [^{18}F]DCFPyL (a Prostate-Specific Membrane Antigen ligand) uptake quantification on positive emission tomography/computed tomography (PET/CT). In contrast to standardized uptake values (SUV), the TBR is less affected by the variability in total tumor-burden between patients (the 'sink effect'). However, TBR depends on tracer uptake interval, has worse repeatability and is less applicable in clinical practice. We investigated whether standardized uptake values (SUV) could provide adequate quantification of [^{18}F]DCFPyL uptake on PET-CT in patients with low prostate cancer (PCa) burden.

Materials & Methods: A total 116 patients with PCa undergoing [^{18}F]DCFPyLPET/CT imaging were retrospectively included. All [^{18}F]DCFPyL-avid lesions suspect for PCa were semi-automatically delineated. SUV_{peak} was plotted against TBR for the most intense lesion of each patient. The correlation of SUV_{peak} and TBR was evaluated using linear regression, and was stratified for patients undergoing PET/CT in the primary staging, the biorecurrent setting and metastasized castration-resistant PCa setting. Moreover, the correlationn was evaluated as a function of uptake time, PSA and tumor volume.

Results: A total of 436 lesions was delineated (median 1 per patient, range 1-66). SUV_{Peak} correlated well to TBR in patients with PCa and a total tumor volume of <200 ml (R^2=0.931) (Figure 1). The correlation between SUV and TBR was not affected by PSA levels or tumor volume. SUV_{peak} remained more stable over time compared to TBR.

Figure 1. Linear regression of maximal SUVpeak versus TBR values of the most intense lesion suspect for PCa on [18F]DCFPyL PET/CT in 116 patients. R2 measured 0.931, and the slope of the regression was 1.032. SUV= Standardized Uptake Value, TBR=Tumor-to-Blood Ratio



Conclusions: For [^{18}F]DCFPyL PET/CT, SUV is a valuable simplified semi-quantitative measurement in patients with low volume prostate cancer (<200 ml), with high correlation to the TBR. SUV can therefore be potentially applied to improve precision and accuracy of [^{18}F]DCFPyL PET/CT scans, as imaging biomarker to characterize tumors and monitor treatment outcomes. Although the presence of a sink-effect has been demonstrated for [^{18}F]DCFPyL PET/CT previously, we could not identify the threshold tumor volume for this effect, within our real-life clinical cohort.