

The Uptake of ^{18}F -FDG by Renal Allograft in Kidney Transplant Recipients is not Influenced by Renal Function

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Objective. ^{18}F -Fluorodeoxyglucose (^{18}F -FDG) positron-emission tomography coupled with computed tomography (PET/CT) imaging has been recently proposed as a non-invasive tool for the diagnosis of renal allograft acute rejection (AR) in kidney transplant recipients (KTR). Still, the influence of kidney function on the renal graft uptake of ^{18}F -FDG remains debated.

Methods. We retrospectively identified all KTR who underwent at least one ^{18}F -FDG PET/CT between January 2010 and December 2015. KTR with documented pyelonephritis or AR, as well as patients under chronic hemodialysis, were excluded. Medical, biological and technical parameters were extracted from a prospective database. Estimated glomerular filtration rate (eGFR) was assessed using chronic kidney disease (CKD)-EPI equation. Mean standardized uptake values (SUVmean) of renal graft cortex and aorta were measured in 4 and 1 volumes of interest, respectively. Spearman's rank correlation coefficient (ρ) and analysis of variance (ANOVA) were performed.

Results. Eighty-two KTR aged of 58 ± 13 underwent ^{18}F -FDG PET/CT for tumor staging (n=46), suspected infection (n=11) or fever of unknown origin (n=25). Male-to-female ratio was 1.4. Mean eGFR was 50 ± 19 ml/min/1.73m² [range: 20.7; 94.4], including CKD stage 1 (n=3), stage 2 (n=21), stage 3a (n=20), stage 3b (n=29) and stage 4 (n=9). PET/CT imaging was performed within 67 ± 15 min following injection of 3.7 ± 0.6 MBq/kg of ^{18}F -FDG. Mean glycemia at the time of injection was 113 ± 34 mg/dl. Mean kidney and aorta SUVmean were 1.8 ± 0.2 and 1.7 ± 0.3 , respectively. No significant correlation was observed between eGFR and kidney SUVmean (ρ , 0.119; p , 0.28) or aorta SUVmean (ρ , -0.144; p , 0.20) considering the whole cohort. ANOVA showed no difference of kidney (p , 0.62) and aorta (p , 0.85) SUVmean between CKD groups. Mean coefficient of variation (on the basis of kidney SUVmean of >3 consecutive ^{18}F -FDG PET/CT in 15 patients with no significant change of eGFR) reached 13.05%.

Conclusion. Our data suggest that the uptake of ^{18}F -FDG by renal allograft within an hour *post* injection is not significantly impacted by CKD.