

P2014 Use of ^{18}F -FDG-PET/CT and $^{99\text{m}}\text{Tc}$ -HMPAO-WBC-SPECT/CT in diagnosis of prosthetic material-associated cardiovascular infections

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Background: One of the most dreaded complication after cardiovascular surgery are infections of prosthetic devices. Over the past years, the number of patients with suspected prosthetic material-associated cardiovascular infections (PMACVI) has progressively risen because of increased use of prosthetic valves (PV) and pacemakers (PM), left ventricular assist devices (LVAD) and prosthetic vascular grafts (PVG). These infections present great challenges in diagnostics. Diagnosis is based on associations of clinical symptoms, imaging findings and microbiological cultures. The angio-CT scan is considered the gold standard, but sensitivity and specificity are not great. Radionuclide imaging of infectious processes has gained an important role in management of diagnostically challenging PMACVI. The aim of our study was to directly compare two competing molecular imaging techniques - ^{18}F -FDG PET/CT and $^{99\text{m}}\text{Tc}$ - HMPAO-WBC SPECT/CT.

Materials/methods: Between November 2015 and November 2017 patients with suspected PMACVI underwent both ^{18}F -FDG PET/CT (1 hour after injection) and $^{99\text{m}}\text{Tc}$ HMPAO-WBC-SPECT/CT (4 and 20 hours after reinjection) in time span of <14 days. The results of ^{18}F -FDG PET/CT and $^{99\text{m}}\text{Tc}$ HMPAO-WBC-SPECT/CT were analysed separately by experienced nuclear-medicine physicians. The final diagnosis was based on positive microbiological cultures from the site of infection and patient follow- up.

Results: 33 patients were included in our prospective study. 21 of them had PMACVI. With ^{18}F -FDG PET/CT 7 patients were correctly diagnosed as positive, 1 patient as false positive (FP), 2 patients as false negative (FN), 6 patients as true negative (TN) and 17 results were equivocal. With $^{99\text{m}}\text{Tc}$ -HMPAO-WBC SPECT/CT 17 patients were correctly diagnosed as positive, 1 patients as FP, 3 patients as FN, 11 patients as TN and 1 result was equivocal. Sensitivity, specificity, positive predictive value, negative predictive value and accuracy of each imaging modality were 86%, 67%, 82%, 79% and 79%, respectively, for ^{18}F -FDG PET/CT; and 81%, 92%, 94%, 73% and 85%, respectively, for $^{99\text{m}}\text{Tc}$ - HMPAO-WBC SPECT/CT in patient-based analyses.

Conclusions: It was significantly more challenging to identify PMACVI with ^{18}F -FDG PET/CT, seeing that 17 out of 33 results were equivocal. $^{99\text{m}}\text{Tc}$ - HMPAO-WBC SPECT/CT offers higher specificity than ^{18}F -FDG PET/CT, hence a sequential strategy for the diagnosis of PMACVI has been proposed.

