



[18F]FDG-PET/CT and 99mTc-HMPAO-labeled leukocytes SPECT/CT imaging in a case series patients with possible infective endocarditis: which and when to use them

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Infective endocarditis (IE) is associated with high morbidity and mortality rates, often associated with local complications or distant embolization. The appropriate antibiotic therapy significantly reduces the risk of embolic complications. The prompt diagnosis is crucial to establish adequate therapy. The Duke criteria, based on clinical, biological/microbiological, and imaging parameters, are currently employed to diagnose IE, classifying the diagnosis of IE as definite, possible, or rejected. Nuclear medicine procedures, such as 2-deoxy-2-[fluorine-18]fluoro-D-glucose Positron Emission Tomography/Computed Tomography ([18F]FDG-PET/CT) and radiolabeled white blood cells (WBC) scintigraphy, are included in Duke major criteria. This study aims to compare [18F]FDG-PET/CT and WBC scintigraphy in patients with valve prostheses and possible IE to understand which and when to perform them. We retrospectively evaluated 7 patients with possible IE according to Duke's criteria. All patients underwent [18F]FDG-PET/CT and WBC scans within 10 days. [18F]FDG-PET/CT was positive in all patients showing high focal uptake of FDG ($SUV_{max} > 4.5$) on the prosthetic valve. WBC scintigraphy was negative in all patients showing no uptake or mild and decreasing accumulation of labeled leukocytes on heart prosthetic valve. Final diagnosis, based on 12 months of clinical follow-up, was negative for IE in all patients.

Our study showed 7 false positives [18F]FDG-PET/CT results and 7 true negative WBC scintigraphies results. WBC scintigraphy avoids unnecessary long antibiotic therapy. Our findings, even based on a small number of patients, suggest to perform [18F]FDG-PET/CT only in patients with a very low probability of IE, the high negative predictive value of [18F]FDG-PET/CT allows in fact to rule out the presence of IE. In patients with possible IE our data suggest to perform WBC scintigraphy. The high specificity of WBC scintigraphy allows to differentiate the non-specific [18F]FDG uptake due to aseptic condition from the specific FDG uptake due to infection.

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