Respective performance of 18F-FDG PET and radiolabeled leukocyte scintigraphy for the diagnosis of prosthetic valve endocarditis.

Abstract:
Echocardiography plays a key role in the diagnosis of infective endocarditis (IE) but can be inconclusive in patients in whom prosthetic valve endocarditis (PVE) is suspected. The incremental diagnostic value of (18)F-FDG PET and radiolabeled leukocyte scintigraphy in IE patients has already been reported. The aim of this study was to compare the respective performance of (18)F-FDG PET and leukocyte scintigraphy for the diagnosis of PVE in 39 patients. (18)F-FDG PET and leukocyte scintigraphy were performed on 39 consecutive patients admitted because of clinically suspected PVE and inconclusive echocardiography results. The results of (18)F-FDG PET and leukocyte scintigraphy were analyzed separately and retrospectively by experienced physicians masked to the results of the other imaging technique and to patient outcome. The final Duke-Li IE classification was made after a 3-mo follow-up. Of the 39 patients, 14 were classified as having definite IE, 4 as having possible IE, and 21 as not having IE. The average interval between (18)F-FDG PET and leukocyte scintigraphy was 7 ± 7 d. Sensitivity, specificity, positive predictive value, negative predictive value, and accuracy were 93%, 71%, 68%, 94%, and 80%, respectively, for (18)F-FDG PET and 64%, 100%,
100%, 81%, and 86%, respectively, for leukocyte scintigraphy. Discrepancies between the results of (18)F-FDG PET and leukocyte scintigraphy occurred in 12 patients (31%). In patients with definite IE, 5 had true-positive (18)F-FDG PET results but false-negative leukocyte scintigraphy results. Of these 5 patients, 3 had nonpyogenic microorganism IE (Coxiella or Candida). Of patients for whom endocarditis had been excluded, 6 had true-negative leukocyte scintigraphy results but false-positive (18)F-FDG PET results. These 6 patients had been imaged in the first 2 mo after the last cardiac surgery. The last patient with a discrepancy between (18)F-FDG PET and leukocyte scintigraphy was classified as having possible endocarditis and had positive (18)F-FDG PET results and negative leukocyte scintigraphy results. (18)F-FDG PET offers high sensitivity for the detection of active infection in patients with suspected PVE and inconclusive echocardiography results. Leukocyte scintigraphy offers a higher specificity, however, than (18)F-FDG PET for diagnosis of IE and should be considered in cases of inconclusive (18)F-FDG PET findings or in the first 2 mo after cardiac surgery.