18F-FDG PET/CT as a diagnostic tool for cardiac implantable electronic device infections

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Background: The diagnosis of infective endocarditis (IE) in patients with cardiac implantable electronic devices (CIED) remains a clinical challenge. The modified Duke criteria have suboptimal diagnostic accuracy in this population, highlighting the need for alternative diagnostic tools.

Purpose: This retrospective study aimed to evaluate the diagnostic value of 18F-FDG PET/CT in suspected CIED infection.

Methods: From May 2016 to January 2022, 87 patients referred for 18F-FDG PET/CT for suspected IE were included in the study. The final diagnosis of IE was established by consulting the endocarditis team’s diagnosis at the time of hospital discharge or death, based on clinical, microbiological, and imaging information as well as clinical response. Sensitivity, specificity, and positive and negative predictive values of 18F-FDG PET/CT in the evaluation of CIED infection were estimated.

Results: Of the 87 patients, 10 had suspected CIED infection, with a median age of 75 years. Pacemaker was the most common device found (65%). Fever was present in 80% of patients, and laboratory results showed a mean C-reactive protein of 15.9 mg/dL and mean leucocyte count of 10.5 G/L. According to the Duke Criteria, 60% were classified as “possible diagnosis,” 20% with “definitive diagnosis,” and 20% as “rejected diagnosis.” Of the suspected CIED infection patients, compatible findings in 18F-FDG PET/CT were observed in 7 patients. The calculated sensitivity of 18F-FDG PET/CT was 78%, and specificity was 100%.

Conclusion: Our study suggests that 18F-FDG PET/CT is a valuable imaging tool for patients with suspected CIED infections, providing high sensitivity and specificity. The use of this technique could aid in the diagnosis of infective endocarditis and guide treatment decisions, particularly in cases where the modified Duke criteria have limited diagnostic accuracy.