PET/CT for endocarditis in the ACC/AHA 2020 valve guidelines: Ready for prime time?

We read with great interest the long awaited 2020 ACC/AHA guidelines for valvular heart disease management.¹ Although we applaud the introduction of ¹⁸F-fluorodeoxyglucose positron emission tomography/computed tomography (¹⁸FDG-PET/CT) in the management algorithm for patients with possible endocarditis by the Modified Duke Criteria, we caution against its broader use in native valve endocarditis. Contemporary literature best supports the use of ¹⁸FDG-PET/CT for prosthetic valve or cardiac implantable electronic device (CIED, at least 3-months from implantation) endocarditis (pooled sensitivity 72% to 86%, specificity 83% to 84% in a recent meta-analysis), but not native valve endocarditis (pooled sensitivity only 31%, despite specificity 98%).² Reasons for the latter include more fibrotic and less inflammatory lesions in native valve endocarditis, under-utilization of ECG-gating during scans, limited spatial resolution, and insufficient metabolic preparation with diffuse myocardial uptake masking valve inflammation. Radio-labelled white blood cell single-photon emission computed tomography (WBC-SPECT)/CT enhances specificity of “inflammation” imaging and may be utilized for this purpose.³

The revised guidelines appropriately incorporate new imaging modalities in the management of endocarditis. However, the expansion of ¹⁸FDG-PET/CT utilization beyond prosthetic valve/CIED infection detection and without a time horizon from CIED insertion may confuse the diagnosis and result in unwarranted high risk therapies. A nuanced approach with ¹⁸FDG-PET/CT as a highly sensitive test late after prosthetic valve/CIED insertion and (WBC-SPECT)/CT as a high specific test early after prosthetic valve/device is warranted.^{2,3} Therefore, we propose distinctions between native and prosthetic valve/CIED endocarditis, and consideration of timing from surgery. Limited diagnostic accuracy of ¹⁸FDG-PET/CT in native valve endocarditis should be emphasized. In suspected

prosthetic valve/CIED infection where echocardiography is negative or inconclusive, ¹⁸FDG-PET/CT should be performed because of excellent sensitivity and wide availability for diagnosis and evaluating perivalvular complications. If increased specificity is required, which may be especially relevant soon after surgery, (WBC-SPECT)/CT can provide confirmation of these diagnoses.

Wael A. Jaber, MD,^a Tom Kai Ming Wang, MBChB, MD(res),^a Paul C. Cremer, MD^a

^aSection of Cardiovascular Imaging, Heart, Vascular and Thoracic Institute, Cleveland Clinic, 9500 Euclid Avenue, Main Campus J1-5, Cleveland, OH 44195, USA

Funding statements

None to declare for all authors.

Disclosures Authors Dr Jaber, Dr Wang and Dr Cremer with no conflicts of interest to declare

References

1. Otto CM, Nishimura RA, Bonow RO, Carabello BA, Erwin JP 3rd, Gentile F et al (2021) 2020 ACC/AHA guideline for the management of patients with Valvular Heart Disease: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol* 77(4):e25-e197
2. Wang TKM, Sánchez-Nadales A, Igbinomwanhia E, Cremer P, Griffin B, Xu B (2020) Diagnosis of infective endocarditis by subtype using (18)F-fluorodeoxyglucose positron emission tomography/computed tomography: A contemporary meta-analysis. *Circ Cardiovasc Imaging* 13(6):e010600
3. Erba PA, Conti U, Lazzeri E, Sollini M, Doria R, De Tommasi SM et al (2012) Added value of 99mTc-HMPAO-labeled leukocyte SPECT/CT in the characterization and management of patients with infectious endocarditis. *J Nucl Med* 53(8):1235-1243

doi:10.1007/s12350-021-02748-x

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.