The Old and New Concept of HFpEF Revealed With Echocardiography and CV Imaging

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Nearly one-half of patients with heart failure (HF) have preserved left ventricular (LV) ejection fraction (EF), and the prevalence of this form of HF (i.e., HF with preserved EF [HFpEF]) appears to be steadily increasing. Particularly, HFpEF comprises nearly 90% of incident case of HF in elderly women. More importantly, although the patients with HFpEF experiences similar patterns of morbidity and functional impairment as do those with HF with reduced EF (HFrEF), there are few treatments currently available for HFpEF. Therefore, the prognosis of HFpEF is worsening whereas that of HFrEF is improving. Hence, there is a need for a better understanding of HFpEF pathophysiology which can lead to the improvement in treatment of HFpEF patients.

Various mechanisms have been suggested to explain the pathophysiology of HFpEF, but many remain hypothetical due to the limited access to live human heart tissue and the lack of relevant experimental models. In this regards, recent advances in cardiovascular imaging, including echocardiography, computed tomography, cardiac magnetic resonance imaging, and positron emission tomography, have the potential to provide novel insights into the pathogenesis of HFpEF. While the current guidelines highlight the role of diastolic dysfunction by conventional echocardiography for the diagnosis of HFpEF, novel imaging technologies enable a more comprehensive assessment of HFpEF pathophysiology, such as the analysis of myocardial mechanics, quantification of extra-cellular matrix, evaluation of myocardial blood flow, and detection of metabolic derangements, potentially providing additional information to diagnose HFpEF more exactly.