Abstract

Aims: Heart failure with preserved ejection fraction (HFpEF), which is caused by wide various conditions, has become a major public health problem. Transthyretin amyloid cardiomyopathy (ATTR-CM), which is thought to be an underdiagnosed disease, can cause HFpEF. Noninvasive diagnosis using ^{99m}Technetium (Tc)- pyrophosphate (PYP) scintigraphy enables accurate diagnosis of ATTR-CM. The aim of this study was to clarify the prevalence and characteristics of ATTR-CM among Japanese patients with HFpEF.

Methods: This study was a multicenter, prospective, observational study conducted in Japan. We enrolled 373 patients with HFpEF (left ventricular (LV) ejection fraction ≥ 50%) aged ≥ 65 years old who were admitted to the department of cardiology from September 2018 to January 2022. A ^{99m}Tc- PYP scintigraphy scan was performed during admission in all eligible patients. Cardiac ^{99m}Tc-PYP retention was graded according to a previously reported visual scale ranging from 0 to 3 points. The scan was considered positive when it revealed moderate-to-severe ^{99m}Tc-PYP uptake (grade 2–3) in both ventricles. Patients were divided into ATTR-CM and non-ATTR-CM patients according to positive (grade 2-3) or negative (grade 0-1) 99mTc-PYP scintigraphy, respectively. Medical history, blood tests, electrocardiogram, echocardiography, and magnetic resonance imaging in the two groups of patients were compared.

Results: Among the 373 patients with HFpEF, 53 patients (14.2%; 95% confidence

interval: 10.7-17.7) showed positive uptake on ^{99m}Tc-PYP scintigraphy. An endomyocardial biopsy was performed in 32 patients and confirmed amyloidosis in all cases. There were no significant differences between the two groups in age, severity of heart failure as assessed by the NYHA functional classification, renal function values, left ventricular ejection fraction and tricuspid regurgitant pressure gradient (ATTR-CM, n=53 vs non-ATTR-CM, n=320). Patients in the ATTR-CM group had a higher N-terminal pro-brain natriuretic peptide level (2314 [1081-3398] vs 900 [415-1828] , P<0.001), higher sensitive troponin T level (0.074 ± 0.049 vs 0.035 ± 0.038, P<0.001) and higher mean LV maximal wall thickness (12.5 [11-14] vs 10.5 [9.5-11.5], P<0.001).

Conclusions: ATTR-CM is an underdiagnosed disease with a significant prevalence in Japanese patients with HFpEF. This study showed that results of examinations for ATTR-CM patients appear to be worse than those for non-ATTR-CM patients, but clinical severities of heart failure as assessed by the NYHA functional classification are similar in ATTR-CM and non-ATTR-CM patients and the clinical overlap between ATTR-CM and non-ATTR-CM is high.