Cardiac amyloidosis revealed by bone scintigraphy in heart failure with preserved ejection fraction

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Background: Heart failure with preserved ejection fraction (HFpEF) is a heterogeneous clinical syndrome with multiple underlying causes. Transthyretin amyloidosis (ATTR) is an underdiagnosed cause of HFpEF. Extraosseous uptake, in particular, myocardial uptake, was observed in a number of ATTR patients examined with the bone scan tracers.

Objectives: We sought to determine the prevalence of ATTR as detected by the bone scan among the patients admitted due to HFpEF.

Methods: We screened all consecutive patients =60 years old admitted due to HFpEF [left ventricular ejection fraction =50%] . All eligible patients were offered an echocardiogram and a bone scan (a 99mTc-PYP/MDP/HMDP scintigraphy). Echocardiographic and clinical variables were gathered in all the subjects. The intensity of the myocardial uptake was graded according to a visual scale ranging from 0 to 3 points, in which the absence of uptake was assigned a score of 0 points; uptake less than that of bone (referred to as the adjacent rib), 1 point; uptake similar to that of bone, 2 points; and uptake greater than that of bone, 3 points. The distribution of the uptake in myocardium was defined as focal uptake, diffuse uptake, uptake in a ventricular wall segment, diffuse ventricular uptake, or diffuse biventricular uptake.

Results: The study included 58 HFpEF patients (59% women, 76 ± 8 years). The bone scintigraphic analysis revealed relatively intense myocardial uptake in 6 of 58 patients (10.3%). 6 patients had intense Tc-99m uptake (score of 2-3) in the cardiac region, showing deposition in both right and left ventricles in every case. Patients with amyloid deposition were older (80±4 vs. 72±12 years, p < 0.05), had a lower systolic blood pressure (120±21 vs. 151±28 mmHg, p < 0.05), and left ventricular ejection fraction (53±9 vs. 60±7%, p < 0.05). Both groups had at least moderate left ventricular hypertrophy and abnormal global longitudinal strain with no significant difference between groups. In 6 all the cases, the final diagnosis of amyloidosis was based on the results of abdominal fat aspiration biopsy.

Conclusion: ATTR is an underdiagnosed disease that accounts for a significant number (10.3%) of HFpEF cases. These findings create an opportunity for further investigation in the targeted therapy of patients with HFpEF.