Randall-type monoclonal immunoglobulin deposition disease: description of cardiac involvement

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Background: Randall-type monoclonal immunoglobulin disease (MIDD) is a rare complication of a monoclonal plasma cell clone. MIDD differs from AL amyloidosis by the presence of Congo red negative non-organized immunoglobulin (Ig) deposits, most commonly light chains (LCDD) along basement membranes and sometimes heavy chains (HCDD) or light and heavy chains (LHCDD). As AL amyloidosis MIDD is a multi-systemic disease, and affects the heart. To date no study has focused on the clinical characteristics of heart disease in MIDD.
Purpose: The aim of this study was to describe the cardiologic features of patients with biopsy-proven MIDD and suspected cardiac involvement.
Methods: This multi-center, nation-wide retrospective study extracted from the database of the French reference center for AL amyloidosis and other Ig deposition diseases between 2012 to 2019. Diagnosis of cardiac involvement was assessed according to the International Society of Amyloidosis criteria for amyloid heart disease, as follows: left ventricular hypertrophy with a diastolic septum thickness $\geq$12mm, NTproBNP serum level $\geq$332 ng / L, histological evidence on cardiac or extra cardiac biopsy of typical linear non-organized Ig deposits along basement membranes. Severity was defined according to the Mayo Clinic classification for AL amyloidosis.
Results: Among 20 patients included (mean age was 70±9 years), 11 (55%) were males; 13 (65%) were LCDD, 3 (15%) HCDD and 4 (20%) LHCDD. At diagnosis, 19 (95%) had a history of hypertension, 3 (16%) had atrial fibrillation, 3 (15%) had NYHA grade 3 or 4 dyspnea. Mayo Clinic score was stage 3a in 4 patients (20%) and stage 3b in 6 patients (30%). The most frequent ECG changes were microvoltage (40%) and pseudo Q wave (40%); 64% of patients had altered sinus variability on 24-hour Holter monitoring, one patient had a high-grade conduction disorder and another had ventricular tachycardia. On echocardiography, all showed diastolic dysfunction; mean diastolic septum thickness was 13.5mm; only one patient had LVEF impairment but 38% had global longitudinal strain impairment. 10 patients had cardiac MRI, none showed contrast enhancement after gadolinium injection.
After median follow-up of 28 months, 4 patients were hospitalized for heart failure, including 2 with cardiogenic shock. Seven (35%) patients died within a median of 10 months from diagnosis. Among patients with Mayo clinic stage 3 (a or b), 67% died within a median of 8 months from the diagnosis.
Conclusions: To our knowledge, we present the first case series dedicated to the description of cardiac parameters in MIDD patients with cardiac involvement. Except for MRI appearance of cardiac infiltration, these patients showed features close to that of AL amyloid heart disease. Overall prognosis appears seemingly poor in MIDD patients with Mayo Clinic stage 3 cardiac disease.