Abstract: 27

99mTc-DPD scintigraphy in cardiac amyloidosis: clinical reliability based on a case series evaluation

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Topic(s):
Single Photon Emission Computed Tomography (SPECT)

Citation:

Introduction:
Early diagnosis is of major importance in cardiac amyloidosis and 99mTc-DPD scintigraphy (DPD scan) is being recognized as one of the most accurate non-invasive exams for the identification of cardiac transthyretin-related amyloidosis (ATTR).

Aim:
To review the DPD scan contribution for the diagnosis and prognosis of cardiac ATTR.

Population and Methods:
We retrospectively analysed 35 patients (22 males and 13 females, median age=76[P25:68;P75:82] years), referred between September 2014 and July 2018, to perform a DPD scan due to an abnormal echocardiogram or family history of ATTR. The parameters evaluated were: uptake pattern of 99mTc-DPD, evidence of diastolic dysfunction on echocardiogram, NT-proBNP values, biopsies and genetic tests results and family history. DPD scan was considered positive when there was cardiac uptake of the tracer. Cardiac amyloidosis was diagnosed by the referring cardiologist, based on clinical history and complementary exams altogether. Due to the size of the sample, non-parametric statistical tests were applied.

Results:
DPD scan was positive in 12 (34%) patients (cardiac uptake level 2 in 4, and level 3 in 8) with concomitant skeletal muscle uptake in 11/12 (3 level 2 and 8 level 3). There was a very strong statistic evidence of association between a positive DPD scan and the final diagnosis of ATTR (p<.001 Fisher exact test). ATTR was also diagnosed in 2 patients without cardiac involvement and with an expected negative DPD scan (one studied due to a family Val30Met genetic mutation and another with acquired ATTR after a liver transplant). Amongst the 21 patients with a negative DPD scan, 4 were diagnosed with light-chain amyloidosis (AL). Tissue biopsy was performed in 17 patients (49%), genetic tests requested in 14 (49%) and cardiac magnetic resonance in 9 (26%). Genetic tests results were known in 4/12 patients with a positive DPD scan and an ATTR mutation was found in 3 of them. We found no statistically significant difference for the NT-proBNP values (p=.421 Mann-Whitney test) or overall survival in months (p=.075 Mann-Whitney test) between patients with a positive or negative DPD scan. Diastolic dysfunction was found in 11 (92%) patients with a positive DPD scan and in 15 (66%) patients with a negative DPD scan, but there was no statistical evidence of association between the DPD scan result and the presence of diastolic dysfunction (p=.121 Fisher exact test).

Conclusions:
The strong association between the DPD scan result and the diagnosis of cardiac ATTR suggests that clinicians rely on the diagnostic role of 99mTc-DPD scintigraphy. The absence of association between the scan results and markers of prognosis may be explained by a similar severity of cardiac hypertrophy in the evaluated sample and/or its reduced size. Further analysis needs to be performed, especially including magnetic resonance data and global longitudinal strain measurements.
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