Abstract: P2729

NT-proBNP and high-sensitivity cardiac troponin T to diagnose cardiac amyloidosis

Authors:
V Castiglione1, A Aimo1, A Barison2, D Genovesi2, C Prontera2, S Masotti2, A Giannoni2, V Spini2, C Taddei2, C Passino3, M Emdin3, G Vergaro2, 1University Hospital of Pisa - Pisa - Italy, 2Fondazione Toscana Gabriele Monasterio - Pisa - Italy, 3Sant'Anna School of Advanced Studies, Institute of Life Sciences - Pisa - Italy,

Topic(s):
Infiltrative Myocardial Disease

Citation:
Background: Cardiac amyloidosis (CA) is characterized by the accumulation of misfolded proteins into amyloid fibrils, leading to cardiomyocyte toxicity, extracellular volume expansion and ventricular pseudohypertrophy. As a consequence of such processes, natriuretic peptides and cardiac troponins are chronically elevated in CA and hold significant prognostic value. The diagnostic yield of these biomarkers for CA has never been explored so far.

Methods: Plasma levels of N-terminal fraction of pro-B-type natriuretic peptide (NT-proBNP) and high-sensitivity cardiac troponin T (hs-cTnT) were measured in 230 patients referred to a tertiary centre with the clinical suspicion of cardiac amyloidosis. The final diagnosis was established according to current protocols, which include clinical, electrocardiographic, biohumoral, instrumental (echocardiography, cardiac magnetic resonance, diphosphonate scintigraphy), and biopsy examinations.

Results: Patients were aged 79 (interquartile interval 73-83) years and were predominantly males (n=147, 64%). Mean left ventricular (LV) ejection fraction was 55% (48-62%), and mean LV mass indexed was 150 (120-178) g/m2. CA was confirmed in 86 patients (37%), who had either light chain (AL) amyloidosis (n=25, 29%) or transthyretin (ATTR) amyloidosis (n=61, 71%). Alternative diagnoses were hypertensive cardiopathy (n=69, 48%), valvular disease (n=27, 19%), hypertrophic cardiomyopathy (n=18, 13%), or left ventricular hypertrophy with unknown or multifactorial mechanisms. Patients with CA showed higher NT-proBNP (5507 ng/L [2348-10326] vs. 1332 [392-3752], p<0.001) and hs-cTnT (65 ng/L [48-114] vs. 35 [21-52], p<0.001) than those without CA. The area under the curve (AUC) values for NT-proBNP and hs-cTnT were 0.712 and 0.775 respectively (p=0.062 for the difference). The combination of the two biomarkers improved discrimination over NT-proBNP alone (p=0.011), but not over hs-cTnT (p=0.470) (Figure). A NT-proBNP level <600 ng/L or a hs-cTnT level <17 ng/L were optimal for ruling out amyloidosis, with a negative predictive value of 95% in both cases.

Patients with AL amyloidosis had higher NT-proBNP and hs-cTnT than those with ATTR (10809 ng/L [6292-17483] vs. 3084 [1841-7624], p=0.014; 130 ng/L [64-211] vs. 61 [48-95], p=0.006). The difference was even more prominent when biomarker levels were normalized for LV mass (NT-proBNP/LV mass, 33.9 ng/L/g [20.4-53.8] vs. 10.0 [5.8-23.5], p=0.002; hs-cTnT/LV mass, 0.48 ng/L/g [0.25-0.71] vs. 0.19 [0.14-0.26], p=0.001). NT-proBNP and hs-cTnT could effectively discriminate patients with AL amyloidosis among subjects with clinical suspicion of CA (AUC values of 0.787 and 0.805 respectively) (Figure).

Conclusions: Plasma NT-proBNP and hs-cTnT have diagnostic value in patients with suspected CA. In the subgroup with CA, both biomarkers are higher in patients with AL amyloidosis even when normalizing for LV mass, possibly because of a greater cardiotoxic effect of light-chain fibrils.
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