Circulating timp1 and beta2microglobulin as biomarkers of cardio-renal remodelling in heart failure and in the athlete’s heart

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\textbf{Background}

Tissue inhibitor of matrix metalloproteinase 1 (TIMP1) is now recognized as a biomarker of ongoing adverse LV remodelling in heart failure patients. Circulating beta2microglobulin (beta2M), the beta chain of HLA class I molecule, represents a biomarker of decreased glomerular filtration rate, of inflammation and high tissue turnover. Its role in heart remodelling has been investigated only in dialysis-related amyloidosis.

\textbf{Aims}

To evaluate the relationships between plasma profile of TIMP1 and beta2M in heart failure (HF) and in the athlete’s heart (AH).

\textbf{Methods}

We investigated plasmatic levels of TIMP1 and beta2M in 25 subjects with stable HF, in 42 veteran marathoners with AH, 48 hours after training, and in 25 sedentary controls. TIMP1 levels were assayed with ELISA; beta2M with AxSym, Abbott. All subjects with acute or chronic inflammatory disease, neoplastic disease, renal or hepatic failure were excluded.

\textbf{Results}

TIMP1 and beta2M showed a strong positive correlation between them both in HF (r=0.7, p<0.001) and in the AH (r=0.5, p=0.001), but not in controls. Circulating levels of TIMP1 and beta2M were much higher in patients with stable HF (TIMP1: 322.1±31.2 ng/ml vs 230.8±9.5 ng/ml in the athlete, p<0.01 and 228.3±11.3 ng/ml in controls, p<0.005; beta2M: 2539.7±294.3 vs 1147.3±37.6 in the athlete, p<0.001 and 1215.2±45.1 in controls, p<0.001) and correlate also with NTpro-BNP and creatinine.

\textbf{Conclusions}

The strong correlation between TIMP1 and beta2M in HF and AH and the correlation of both with NTproBNP and creatinine in HF suggest their clinical application in following the development of pathological cardio-renal remodelling.