B-type natriuretic peptides for the evaluation of exercise intolerance

Christian Mueller, Micha T. Maeder, Andreas Christ, Tobias Reichlin, Daniel Staub, Markus Noveanu, Tobias Breidthardt, Mihael Potocki & Martin Brutsche

BACKGROUND: Cardiopulmonary exercise testing is the method of choice for the differentiation of exercise intolerance. This study sought to assess the utility of B-type natriuretic peptide (BNP) and N-terminal-pro-B-type natriuretic peptide (NT-proBNP) for the identification of a cardiocirculatory exercise limitation. METHODS: In 162 patients undergoing cardiopulmonary exercise testing, rest and peak exercise BNP and NT-proBNP levels were measured. In 94 patients fulfilling criteria for appropriate effort and sufficient diagnostic certainty, the accuracy of BNP and NT-proBNP for the prediction of a cardiocirculatory limitation, as assessed based on clinical and exercise testing data, was determined. RESULTS: A cardiocirculatory limitation was identified in 27 (29%) patients. Median (interquartile range) resting BNP [162 (45-415) vs 39 (19-94) vs 24 (15-46) pg/mL; P <.001] and NT-proBNP [506 (129-1167) vs 77 (35-237) vs 34 (19-77) pg/mL; P <.001] were higher in patients with cardiocirculatory as compared with those with pulmonary limitation (n=28) and those without cardiocirculatory or pulmonary limitation (n=39). The area under the receiver operator characteristics curve for BNP and NT-proBNP to identify a cardiocirculatory limitation was 0.79 and 0.84, respectively (P=.15 for comparison of the curves). Sensitivity and specificity of the optimal BNP cutoff of 85 pg/mL were 63% and 84%, respectively. Sensitivity and specificity of the optimal NT-proBNP cutoff of 223 pg/mL were 74% and 85%, respectively. Peak exercise biomarkers were not more accurate than resting levels. CONCLUSIONS: Among patients referred for cardiopulmonary exercise testing for evaluation of unexplained exercise intolerance, BNP and NT-proBNP were similarly useful to identify those with a cardiocirculatory limitation.