Abstract: P612

Prognostic value of cardiopulmonary exercise testing in heart failure with preserved ejection fraction: a retrospective cohort study.

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Background: Heart failure with preserved ejection fraction (HFpEF) and heart failure with reduced ejection fraction (HFrEF) have similar clinical presentations and long term prognosis. Peak oxygen uptake (VO₂ peak) and ventilatory equivalents for carbon dioxide (VE/VCO₂ slope) measured in cardiopulmonary exercise testing (CPX) are well established as prognostic variables in HFrEF patients. However, there are limited data on the value of cardiopulmonary exercise testing (CPX) variables in patients with heart failure and preserved ejection fraction.

Purpose: To establish the prognostic value of CPX variables in a HFpEF cohort.

Methods: Retrospective cohort study of patients with HFpEF (EF>50%) submitted to CPX between 2014 and 2017. All tests were performed in a treadmill with an incremental ramp protocol. The primary outcome was a composite of all-cause mortality and cardiovascular related hospitalization. Independent samples T-test was used to compare means, univariate and multivariate Cox regression analysis assessed the independent and combined prognostic value for each CPX variable.

Results: A total of 62 patients were included (mean age 62±9 years, 63% female, mean EF 62%), 90% with hypertension, 22% with atrial fibrillation, 12% with coronary artery disease, 19% NYHA I, 84% NYHA II and 17% NYHA III. During a mean follow-up of 622 ± 200 days, the primary outcome occurred in 14 patients (23%). For patients with and without the composite outcome, mean VO₂ peak was 14.0 vs 19.3 mL/kg.min (P<0.001), mean VE/VCO₂ slope was 43.9 vs 35.3 (P<0.001), time necessary for a 50% drop in VO₂ measured at peak exercise (T1/2) was 135 vs 115 seconds (P=0.04) and oxygen uptake efficiency slope (OUES) was 1.06 vs 1.53 (P<0.001), respectively. Exercise oscillatory ventilation was infrequent, without difference between groups. ROC curve analysis showed and optimal cut point for VO₂ peak of 15.85 (AUC = 0.863, sensitivity 79% and specificity 83%, P<0.001) and for VE/VCO₂ slope of 40.0 (AUC = 0.830, sensitivity 79% and specificity 77%, P<0.001). Multivariate analysis showed peak VO₂, with a hazard ratio (HR) = 0.66 (0.52–0.82), and VE/VCO₂ slope, with a HR = 1.08 (1.02–1.15) as strongest prognostic predictors (P<0.001)

Conclusion: In this cohort of HFpEF, VO₂ peak, VE/VCO₂ slope, T1/2 and OUES were univariate predictors of outcomes. After multivariate analysis both VO₂ peak and VE/VCO₂ slope remained as the best prognostic CPX variables.