

Determinants and prognostic value of peak oxygen uptake in the current era of heart failure disease modifying therapy

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Purpose: To study the determinants and accuracy of peak oxygen uptake (VO₂) to predict the outcome of patients with heart failure (HF) in the current era of disease modifying therapy.

Methods: We studied 282 patients with HF who consecutively underwent ergospirometry for prognostic stratification from 2009 to 2015 in a single center. Baseline variables independently associated with peak VO₂ were identified by means of lineal regression. Survival was assessed by means of the Kaplan-Meier method and Cox's regression.

Results: Mean age of studied patients was 52.7 years; 24% were women, 42% had ischemic heart disease and 74% had reduced LVEF (<0.40). NYHA III or IV class was present in 36% cases. 92% patients were on beta-blockers, 79% on ACEI/ARBs and 70% on MRAs. Mean VO₂ was 19.6±5.2 ml/kg/min. In multivariable linear regression, age (p<0.001), NT-pro-BNP (p<0.001), body mass index (p<0.001), and female sex (p=0.027) were independently associated with lower VO₂, while TAPSE (p<0.001) was independently associated with higher VO₂. A peak VO₂ < 14 ml/kg/min was associated with significantly higher risk of the composite outcome death, heart transplantation or need for mechanical circulatory support during follow-up (HR 2.38, 95% CI 1.10–5.26, p=0.027).

Conclusions: Peak VO₂ retains a significant prognostic value in the current era of HF disease modifying therapy. In our study, age, female gender, body mass index, NTproBNP and TAPSE were identified as independent clinical determinants of peak VO₂.