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IMPACT OF EXERCISE CAPACITY BEYOND ANAEROBIC THRESHOLD

ACC Poster Contributions
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Session Title: Exercise Physiology and Ventilatory Factors
Abstract Category: Exercise Physiology and Testing
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Background: In patients (Pts) with heart failure (HF), the aerobic capacity as measured by ventilatory anaerobic threshold (VAT) and peak oxygen uptake (PVO2) predicts outcomes. Dyspnea has been found to be more limiting in individuals unable to sustain exercise beyond VAT. The purpose of this study is to compare post-aerobic capacity to HF events and mortality.

Methods: To study this question in a population prior to recommended use of beta blockers which variably limit peak heart rate, we examined data collected in 142 Pts with LVEF < 40% after myocardial infarction (MI) who participated in a randomized trial of the use of captopril for secondary prevention. Maximal bicycle exercise testing with continuous gas exchange measurement was performed 3-6 months after MI. The increase in VO2 beyond VAT was defined as BAT-VO2. Cox proportional hazards regression analysis was used and hazard ratios (HR) for PVO2 and BAT-VO2 were calculated for increments of 10 ml/min.

Results: Age was 57 ± 10 yrs, LVEF was 33 ± 6 % and NYHA I / II / III / IV were 88 / 41 / 9 / 1 [TABLE]. There were 29 events (22 HF, 10 deaths); hazard ratio (adjusted for age, gender, LVEF and NYHA) for BAT-VO2 was 0.81 (p=0.013), while that for PVO2 was 0.91 (p=NS).

Conclusions: In this study BAT-VO2 was a stronger predictor of adverse events than PVO2 in Class I-II HF. This suggests ability to exercise beyond VAT as a new integrative measure that is related to severity of disease and may be important in defining factors that limit both activity and survival in heart disease.

Variable	Mean ⊥ SD	Chi-Square	Hazard Ratio	95% CI	*p*
Age, years	57.3 (10.3)	3.1794	0.958	0.914-1.004	0.0746
Male Gender, n (%)	122 (85.9)	0.1107	0.831	0.280-2.470	0.7393
LVEF, %	32.5 (5.6)	19.8293	0.849	0.790-0.912	<.0001
NYHA	1.4 (0.7)	3.9479	1.618	1.007-2.600	0.0469
PVO2, ml/min	1429.8 (557.7)	0.8047	0.913	0.747-1.114	0.3697
BAT-VO2, ml/min	362.1 (272.0)	6.1281	0.811	0.687-0.957	0.0133

Values are represented as mean (SD) beside Male Gender. The hazard ratios for PVO2 and BAT-VO2 were calculated for increments of 10 ml/min. CI, confidence interval; LVEF, left ventricular ejection fraction; NYHA, New York Heart Association functional class; PVO2, peak oxygen uptake; BAT-VO2, the difference between PVO2 and VO2 at ventilatory anaerobic threshold.