Relation between VE/VCO2 slope and maximum phonation time in chronic heart failure patients

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**[Purpose]** This study aimed to determine the relation between the regression slope relating minute ventilation to carbon dioxide output (VE/VCO\(_2\) slope) and maximum phonation time (MPT), and the MPT required to attain a threshold value for VE/VCO\(_2\) slope of \(\leq 34\) in chronic heart failure (CHF) patients. **[Methods]** This cross-sectional study enrolled 115 CHF patients (mean age, 54.5 years; men, 84.9%). VE/VCO\(_2\) slope was assessed during cardiopulmonary exercise testing (CPX). Thereafter, patients were divided into two groups according to exercise capacity: VE/VCO\(_2\) slope \(\leq 34\) (VE/VCO\(_2\) \(\leq 34\) group, \(n = 81\)) and VE/VCO\(_2\) slope \(> 34\) (VE/VCO\(_2\) \(> 34\) group, \(n = 34\)). For MPT measurements, all patients produced a sustained vowel/a:/ for as long as possible during respiratory effort from a seated position. **[Results]** All subjects showed significant negative correlation between VE/VCO\(_2\) slope and MPT \((r = -0.51, P < .001)\). After adjustment for clinical characteristics, MPT was significantly higher in the VE/VCO\(_2\) \(\leq 34\) group versus VE/VCO\(_2\) \(> 34\) group \((21.4 \pm 6.4 \text{ vs. } 17.4 \pm 4.3 \text{ sec, } F = 7.4, P = .007)\). The appropriate MPT cut-off value for identifying a VE/VCO\(_2\) slope \(\leq 34\) was 18.12 sec. **[Discussion]** An MPT value of 18.12 sec may be a useful target value for identifying CHF patients with a VE/VCO\(_2\) slope \(\leq 34\) and for risk management in these patients.