European Respiratory Society
Annual Congress 2013

Abstract Number: 1954

Publication Number: P5147

Abstract Group: 4.1. Clinical respiratory physiology, exercise and functional imaging

Keyword 1: Gas exchange **Keyword 2:** Chronic disease **Keyword 3:** Pulmonary hypertension

Title: Ventilatory response to exercise in patients with heart failure and COPD

Dr. Paola 14160 Gargiulo paolagargiulo@hotmail.it MD [1], Dr. Anna 14161 Apostolo anna.apostolo@ccfm.it MD [1], Dr. Maurizio 14162 Bussotti maurizio.bussotti@fsm.it MD [2], Dr. Erica 14163 Gondoni ericagondoni@gmail.com MD [1], Dr. Giovanni 14164 Marchese giovanni.marchese@alice.it MD [2], Dr. Mattia 14170 Internullo m.internullo@virgilio.it MD [3], Dr. Matteo 14172 Bonini matte.bonini@gmail.com MD [3], Prof. Paolo 14173 Palange paolo.palange@uniroma1.it MD [3] and Prof. Piergiuseppe 14178 Agostoni piergiuseppe.agostoni@unimi.it MD [1,4,5]. [1] Cardiovascular Unit, IRCCS Centro Cardiologico Monzino, Milan, Italy ; [2] Division of Cardiovascular Rehabilitation, IRCCS Fondazione Salvatore Maugeri, Milan, Italy ; [3] Department of Public Health and Infectious Diseases, "Sapienza" University, Rome, Italy ; [4] Department of Clinical Sciences and Community Health, University of Milan, Milan, Italy and [5] Division of Pulmonary and Critical Care and Medicine, Department of Medicine, University of Washington, Seattle, Italy .

Body: Background: Ventilatory response to exercise in patients with coexisting heart failure (HF) and chronic obstructive pulmonary disease (COPD) is hardly predictable: there is an out-of-proportion increase of ventilation in HF, while the rise of ventilation is blunted in COPD. The ventilation (VE) behaviour during exercise is defined by its relation with carbon dioxide production (VCO2), according to a linear relationship (VE=aVCO2+b), where “a” is the slope, commonly used to define ventilatory efficiency, and “b” is the intercept on VE axis (VEYint), corresponding to dead space ventilation. This study aimed to evaluate the ventilatory response to exercise in patients with HF and COPD assessing the slope and the VEYint of VE vs VCO2 in COPD+HF, COPD, HF, pulmonary arterial hypertension (PAH) patients and in healthy controls. Methods: Inclusion criteria were: EF≤40% and FEV1/FVC<0.70% for COPD+HF patients, EF≤40% and FEV1/FVC>0.70% for HF patients, preserved EF and FEV1/FVC<0.70% for COPD patients. All patients performed spirometry and an incremental cardiopulmonary exercise test on cycloergometer. Results: This is a prospective, multicenter study that enrolled 355 patients (79 COPD+HF, 78 HF, 74 COPD, 57 PAH patients and 67 healthy subjects). Results are shown in table I.

Table I: Study results

	COPD + HF	HF	COPD	PAH	Controls
VE/VCO2 slope	29.29±7.44∗†	32.11±6.10∗†	31.83±5.64∗†	37.04±10.53	23.85±2.80
VEYint	5.10±1.69∗§	3.64±2.02&	6.06±2.96∗†	3.08±3.31	3.98±2.50

∗p≤0.05 vs PAH; †p≤0.05 vs Controls; §p≤0.05 vs COPD; &p≤0.05 vs HF

Conclusion: VEYint is elevated in COPD+HF and COPD patients, but not in HF, PAH and healthy subjects, regardless of the slope of VE vs VCO2.