European Respiratory Society
Annual Congress 2013

Abstract Number: 2724

Publication Number: P2510

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

Keyword 1: COPD - mechanism **Keyword 2:** Exercise **Keyword 3:** Extrapulmonary impact

Title: Cardiopulmonary exercise test (CPET) may show initial left cardiac dysfunction in patients with moderate-severe chronic obstructive pulmonary disease (COPD)

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Body: Cardiopulmonary exercise testing (CPET) is usefull to evaluate exercise intolerance in patients with cardio-pulmonary diseases. Cardiovascular comorbidity is frequent in COPD patients and contribute to their exercise limitation. Aim: to assess whether CPET is a sensitive test in detecting initial alterations in cardiac function in COPD patients, as assessed by echocardiography. Methods: we studies 36 COPD patients (mean FEV1: 59.8%) attending to a Pulmonary Rehabilitation Program (PRP). Before starting PRP they performed: pulmonary function test, CPET, echocardiography. Results: when patients were divided according to airway obstruction (FEV1> or <50%) or airway hyperinflation (TLC > or < 120%) no significant differences were found in cardiac parameters measured by echocardiography. There were no differences in echocardiography parameters when we divided patients on the basis of peak VO2 obtained at the CPET. When we divided patients on the basis of VE/VCO2 value, those with VE/VCO2 value > 35% had a significantly lower cardiac output and lower stroke volume with respect to subjects with VE/VCO2 value less than 35%

	Ve/VCO2 >35%	VE/VCO2<35%	VO2 > 15 ml/min/kg	VO2<15 ml/min/Kg
CO(L/min)	4.1±1.0	5.4±1.3*	5.0±1.4	5.1±1.4
Stroke volume (ml)	60.2±15.5	76.1±15.5§	69.6±16.6	74.8±17.9
PAPS	41.2±15.7	37.9±8.4	38.3±8.1	39.5±13.7

*p=0.017; §p=0.024; OC= cardiac output, PAPS

Conclusion: in moderate to severe COPD patients VE/VCO2 is the best parameter for assessing left cardiac dysfunction that contributes to ventilatory inefficiency during exercise.